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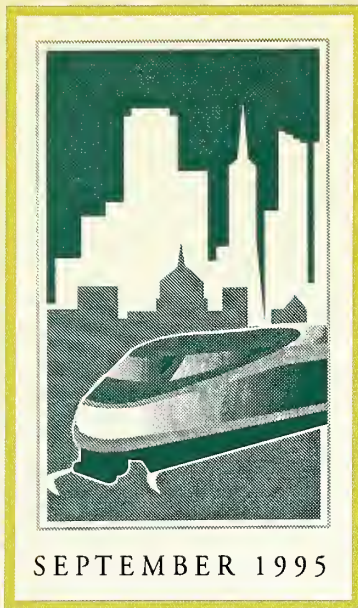
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CALTRAIN SAN FRANCISCO
DOWNTOWN EXTENSION PROJECT
CONCEPTUAL DESIGN AND DRAFT EIS/EIR

Screening Capital Cost Estimates

PENINSULA CORRIDOR JOINT POWERS BOARD

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CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION DEIS/DEIR

SCREENING CAPITAL COST ESTIMATES



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PREPARED FOR THE

CORRIDOR JOINT POWERS BOARD

PREPARED BY

ICF KAISER ENGINEERS, INC

October 3, 1995

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CalTrain San Francisco
downtown extension
1995.

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ICF KAISER ENGINEERS
Estimate Review And Sign-off Sheet

Job Number: 65928-005-04

Estimate Issue Date: 10/03/95

Project Name: CALTRAIN DOWNTOWN EXTENSION

Client: CalTrain

Location: SAN FRANCISCO, CA

Description of Work: "SCREENING ESTIMATE". Includes estimates for ten CalTrain extension alternatives into Downtown San Francisco. There are six Market/Beale destination alternatives, and four Transbay Terminal destination alternatives. Also included are multiple options.

<u>Estimate Type</u>	<u>End Use</u>	<u>Included in Estimate</u>
6 Bid	✓ Study	✓ Direct Cost
5 Engineers	Proposal	✓ CFOH & Plant
4 Definitive	Budget	✓ ES&P
3 Preliminary	Control	✓ CM
✓ 2 Conceptual	Bid - Target	Escalation
1 Magnitude	Bid - Guar. Max	✓ Contingency
0 Other	Bid - Fixed Price	Fee

Comments:

Prepared By: *[Signature]* *[Signature]* Ext.

Reviewed By: *[Signature]* Date 10/3/95 Ext. 5035
Chief Project Estimator

[Signature] Date 10/3/95 Ext. 5040
Peer Review By

CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT

ESTIMATE CRITERIA

FOR THE

DESIGN OPTIONS SCREENING CAPITAL COST ESTIMATES

FOR

MARKET/BEALE STREET TERMINAL ALTERNATIVES (6) TRANSBAY TERMINAL SITE ALTERNATIVES (4)

The Peninsula Corridor Joint Powers Board (JPB) has contracted with ICF Kaiser Engineers, Inc. to provide consulting services for the preparation of conceptual engineering studies and plans, cost estimates, and a Draft Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the extension of CalTrain to a new downtown San Francisco terminal. These ***Design Options Screening Capital Cost Estimates*** are the second in a series of three capital cost estimates to be prepared for this study. The initial estimates for this project were the ***Rough Order-of-Magnitude (ROM) Capital Cost Estimates*** issued in August 1995.

These estimates generally rely on the ***Draft Capital Cost Methodology Report*** issued on July 28, 1995. Exceptions are explained in this ***Estimate Criteria***.

PURPOSE

These cost estimates are prepared to assist in the evaluation and selection of design options for the ***CalTrain San Francisco Downtown Extension Project***.

Two major alternatives with several design options are under consideration in this study. A primary issue is the selection of the **best site** for the downtown CalTrain terminal. A sub-issue is the specific location, configuration and general arrangement of the terminal station. Five different station sites and configurations have been estimated. An additional critical issue is the selection of the optimum extension alignments and underground construction methods (tunneling or cut-and-cover). A further issue is whether or not the existing CalTrain diesel locomotives can be retrofitted for safe and healthy operation in an underground subway and passenger station environment. As an alternative to the latter, the feasibility of converting the existing diesel locomotives to liquefied natural gas (LNG) is being evaluated. As a third choice for train propulsion, full electrification of the entire 78-mile line from San Francisco to Gilroy is being evaluated. As a fourth choice, dual-mode (diesel and electric) locomotives are being evaluated. These issues have been catalogued and discussed in

detail in the **Design Options Screening Report** issued September 26, 1995.

SCOPE

The scope of these estimates is to evaluate the capital costs of the identified alternatives for providing an approximate 1.5-mile extension of the CalTrain commuter rail line from the existing outlying terminal at Fourth and Townsend Streets directly to downtown San Francisco.

For the **primary** alternatives, two different downtown terminal locations with a total of five different station configurations and four alignment options are being evaluated at this time. The alternatives groups associated with the five terminal station layouts are:

- Alternative 2A: Three-level, 4-track, stacked, center platform subway station at Market/Beale;
- Alternative 2B: Two-level, 4-track, staggered center platform subway station at Market/Beale and Mission/Beale;
- Alternative 2C: Two-level, 4-track, center platform subway station at Mission/Beale;

- Alternative 3A: Two-level, 4-track, center platform aerial station on the site of the existing Transbay Terminal;
- Alternative 3B: Two-level, 4-track, center platform subway station on the site of the existing Transbay Terminal;

Each of the five terminals may be constructed in conjunction with: 1) a predominantly cut & cover alignment; or 2) a predominantly mined tunnel alignment. This set of combinations result in the ten (10) primary alternatives. The alternatives under consideration are defined more precisely by a schematic map and a table in the attachments immediately following this **Estimate Criteria**.

In addition, various other CalTrain extension design options are being evaluated. These design options may be grouped in the following categories;

1. Extended subway options in Mission Bay (2)
2. King Street alignment options (2)
3. Locomotive propulsion options (3)
4. Satellite storage yard location options (1)

These are summarized on a table "Other Design Options Cost Summary" which follows the primary alternative summaries.

Common segments of the various alternatives *and the options* were identified with a cost estimate prepared for each segment. These segments were then arranged in different combinations to form the ten primary alternatives. Appendix A contains the following tables which further define the segments and the alignment options:

1. **Segment Composition of Alternatives** which lists the segments comprising each alternative.
2. **Segment Definition Table** which defines the limits of the segments.
3. **Alignment Schedule** which shows the limits by construction type and method along the various alignments.

PROJECT DEFINITION DOCUMENTS

The **Draft Capital Cost Methodology Report**, July 1995, lists various project definition documents available at the time of preparation of that document.

Since that time, much additional documentation has been prepared. To meet the demanding project schedule, draft and markup drawings have been used for estimate preparation in advance of completion of the formal project drawings. Subsurface geotechnical conditions have been investigated in considerable detail for this project. In particular, the **Draft Report - Geotechnical Findings - CalTrain S.F. Downtown Station Relocation**, September 8, 1995, has been relied on to a considerable extent in estimate preparation. The Underground Construction Board of Consultants report on geotechnical conditions, dated September 27, 1995, has provided additional guidance on construction methods and subsurface construction details. This report is included in Appendix B.

These two documents provide the basis of the design and construction methods for most of the proposed subsurface construction for the downtown CalTrain extension.

Utility relocation is described in the Draft report - **Utilities Inventory and Relocation/Reinforcement Report - Downtown Station Relocation DEIS/DEIR**, August 29, 1995. The estimate contained herein is an edited version of the one contained in subject report.

Additional definition has been provided through written instructions and oral discussions. In addition, various assumptions have been made by the estimating team.

ESTIMATE FORMAT

The estimate is presented using ICF KE's proprietary software **ALTEST** developed for use in preparing capital cost estimates for the analyses of multiple alternatives¹. The estimate is prepared in segments and summarized into the ten (10) primary alternatives. The alternatives are summarized and compared on the **Alternative Comparison** sheet. In turn, these numbers are further condensed to a master summary labeled **Capital Cost Estimates**. This master summary also includes a cost allowance for the bus facilities associated with each alternative. The cost of these bus facilities is presently being estimated as part of the **Transbay Area Plan Study (TAPS)**. See **Discussion** section of this criteria.

The segments comprising each alternative are listed in the **Segment Composition of Alternatives** in Appendix A. Items priced in the segments are termed "**work elements**". For the more important typical trackway sections and stations, detailed pricing by standard account is summarized into "**typical costs**". These typical costs were originally

developed in the **Draft Capital Cost Methodology Report** issued July 28, 1995. Since that time, miscellaneous changes have been made to the original typical costs. The most recent issue of the typical costs is included in this estimate under the appropriate work element category. The developed unit cost is transferred to the appropriate segment estimate as a "**work element**". The pricing is further discussed in the pricing section of this criteria.

The major categories of work elements estimated are: site modifications, trackway, stations, trackwork, traction power, signaling, communications, yards and shops, rolling stock and park-and-ride lots (expansion of existing lots). Traction power, signaling, communications, yards and shops, and rolling stock are estimated in "systemwide" segments. The systemwide segments are segments not attributed to any particular geographic area.

Right-of-way, Engineering and Management, Contingency, and Project Reserve are termed "add-ons" and added below the line.
Escalation is not included at this time.

1. This system was developed more than ten years ago by Kaiser Engineers. During this time period, it has proven its worth on numerous alternatives analyses for UMTA and FTA approved studies.

QUANTITIES

System quantities were taken off the plan-and-profile drawings by segment. Detailed quantity takeoffs were made using the typical section sketches, with allowances made for items not shown. A quantity summary indicating the route-feet(RF) and track-feet(TF) quantities for each segment has been prepared. See **Segment Definition Table** in Appendix A for the summary data.

PRICING

Pricing of all work elements includes labor and burden; construction equipment usage; material; permanent equipment; and contractor's overhead and profit. Mid-1995 craft rates applicable to San Francisco were used. Local San Francisco prices were obtained for selected materials. Vendor quotations were obtained for certain equipment items. Sales tax at 8 1/2 % is included on all materials and equipment.

Using this pricing information, typical costs were developed for the typical sections of trackway and selected additional items. Detailed takeoff and pricing was prepared for the four (4)² Market/Beale terminal station design options and the underground Transbay Terminal site terminal station design option. The initial typical cost development is included in the **Draft Capital Cost Methodology Report**. Additional or revised costs developed subsequently are included in this estimate package.

Where sufficient definition was not available, allowances for such items as dewatering have been made based on experience on similar projects. Factors have been applied on the segment summary sheets where appropriate to reflect non-typical site-specific conditions. For trackway, the major work element for this project, a table has been prepared to calculate the "factor" considering multiple cost impacts simultaneously.

Pricing for additional or replacement locomotives and gallery cars for the passenger trains was developed from review of recent orders for several passenger rail authorities on both the east and west coasts.

2. While there are three Market/Beale terminal stations, Alternative 2A has been estimated for both side platform and center platform configuration.

RIGHT-OF-WAY & RELOCATION

No cost has been included for above or below ground easements of the Catellus property in Mission Bay where a permanent easement in favor of the JPB already exists. It has been assumed that CALTRANS and City of San Francisco property may be acquired at no cost. Certain historic buildings are planned to be purchased (fee take) before construction, carefully underpinned so as to preserve their integrity during construction, and then resold after the construction beneath them is complete.

Relocation costs for impacted businesses has been included. No residential relocations are required.

ENGINEERING AND MANAGEMENT

Engineering and management has been determined on a percentage of construction cost basis. Generally 25% has been used. However, smaller percentages have been used for acquiring new passenger rail cars, locomotives and right-of-way. See tables in the **Add-on** section. Included is engineering and construction management by a general engineering consultant (GEC); and engineering review and administration by the JPB or their agent.

CONTINGENCY

Contingency is an allowance to cover design development, uncertain market conditions at the time of tender, and recognizes the approximate estimating methods used. Contingency **does not** cover changes to the currently identified scope of work. Contingency has been evaluated on a percentage basis by individual work element. The percentage varies from 10% to 40%. See tables in the **Add-on** section.

ESCALATION AND SCHEDULE

This estimate is prepared in **July 1995 dollars**. Escalation to the time of expenditure has not been added, as no detailed implementation schedule has been prepared.

PROJECT RESERVE

Project reserve is an account established to cover unexpected changes in the work scope and unanticipated costs that occur during construction, particularly construction change

orders and claims. It is set at 8% on all items, except for passenger railcar and locomotive purchase where 3% has been used. See tables in the **Add-on** section.

COST EXCLUSIONS

Costs of the following items are excluded from this estimate:

1. Any work at the existing JPB maintenance facilities and the future Pullman Way facility other than 1) LNG fueling facilities and 2) track electrification and the associated requirements for the electrified design option.
2. Trackway, signalling or other upgrades for the existing system other than those specifically listed in the estimate.
3. Park-and-ride lot expansion, including station access improvements.
4. Right-of-way purchase cost for property to be acquired from CALTRANS, the City of San Francisco, and for Catellus property in Mission Bay where a permanent easement in favor of the JPB already exists.
5. Pre-operating "start-up" expenses for the electric and dual-mode locomotive propulsion options.
6. Escalation

ESTIMATE DISCUSSION

In general, it is assumed that design of the various facilities will be similar to that of other systems of comparable size and function, and that standard construction and contracting practices will apply.

1. **Hazardous Materials:** Removal and offsite disposal of identified hazardous materials has been included under the cost category "Environmental Mitigations". Two sites with contaminants have been identified in earlier studies - see estimate behind **Street, Railroad, Structure Modifications, Underpinning and Mitigations** tab. Note that the estimate is based on out-of-state disposal for \$85/CY.
2. **Utilities:** A survey of existing utilities was the basis of most of the utility costs; other utilities were priced on a rough allowance basis. Utilities intersecting subway construction will be supported in place or relocated as necessary. All longitudinal utilities within the guideway construction envelope will be relocated. Overhead electric utilities, if any, that interfere will be raised by installing taller poles. Utility relocation is assumed to be scheduled well in advance of the trackway and station construction.

3. **Bay Bridge Reinforcement:** Special reinforcement for the San Francisco anchorage of the Bay Bridge where the Beale Street cut-and-cover subway would pass close by this massive foundation is required for Alternative 2A-C. This construction is estimated in detail using the construction concept depicted in Plate 6-27 A of the **Draft Report - Geotechnical Findings - CalTrain S.F. Downtown Station Relocation**, September 8, 1995. For the 2B-C and 2C-C alternatives the alignment will be raised and moved as far to the east as possible so that special construction techniques will not be required for these alternatives. See sketch, "Section W", in the **trackway** section of the estimate. The proposed design concepts are under review by Caltrans as this estimate is issued.
4. **Rock Tunneling:** Significant attention has been focussed on the design and the construction methods for the proposed rock tunnels. The Board of Consultants, in their deliberations, during and subsequent to their meetings of July 6, 1995 and September 14, 1995, expressed significant concerns as to the risks involved in rock tunneling in the poor quality rock found along the alignments. In response to this concern, a conservative multiple drift rock excavation scheme for the rock tunnels has been estimated and risk insurance (at a cost of about \$10,000,000 for Alternative 2A-M) has been included. After these impacts are included, the rock tunnels are estimated to cost approximately the same as their respective cut and cover counterparts. The present estimate should not be considered definitive as to the relative cost of these alternative construction techniques. Additional subsurface investigation and design will be necessary before it could definitely be determined which technique will be the less costly to construct.
5. **BART / MUNI Metro Connection:** All terminal stations contain an underground pedestrian connection from the new terminals to the existing BART / MUNI Metro Embarcadero Station. These tunnels vary greatly in length and cost. The Alternative 2A and 2B stations, being constructed adjacent to the Embarcadero Station, are the least costly, with the connection estimated at \$383,000 without add-ons. The Transbay Terminal site for Alternatives 3A and 3B, with a 950-foot long underground pedestrian passageway, has the most costly underground connection at \$19.5 million without add-ons. Intermediate in length and cost is the Alternative 2C terminal, for which all four tracks terminate at Mission Street. It's cost without add-ons is almost \$13,000,000. A separate estimate is included for the pedestrian passageway for the 2C station.
6. **Rail Salvage:** All rail for the ballasted track for new mainline at grade track construction is assumed to be salvaged from the existing mainline track. New rail has been assumed for yard track construction. All direct fixation trackwork is priced assuming purchase of new 136 lb continuous welded rail (CWR).

7. **Locomotive Conversions to LNG:** Subconsultant Southwest Research Institute (SRI) has provided a memorandum estimate for the conversion of the diesel locomotives to liquefied natural gas (LNG) including new LNG fuel tanks. This estimate is \$280,000 per locomotive.
8. **Locomotive Resale:** Allowance has been included for the resale of the surplus diesel locomotives at \$1,000,000 each, post year 2000, for the electrified and dual-mode design options.
9. **Transbay Terminal Site CalTrain Alternatives:** This estimate of the Caltrain portion of the new terminal was prepared using an early draft of the *Transbay Area Plan Study (TAPS)* drawings. ROM estimates are possible at this time using approximate floor areas.
10. **New Transbay Bus Terminal Facilities:** Rough draft estimates for the new Transbay Bus Terminal facilities are included. These were prepared using an early draft of the *Transbay Terminal Area Study (TTAS)* drawings. Parsons Brinkerhoff, as part of this TTAS study, will complete more detailed estimates for these facilities in mid October. In the meantime, it is believed that the included estimates are sufficiently accurate for present purposes.
11. **Railroad Modifications:** Segments 1, 6 and the Sixteenth Street Yard include allowances of \$1,000,000, \$500,000 and \$500,000, respectively, for modifications to the existing Southern Pacific railroad facilities. A "before", "after" and staging track layout of the non-project track is needed to more accurately assess the required cost to modify these facilities.
13. **Temporary Street Decking:** This is a significant cost item in this estimate, usually amounting to nearly 10% of the construction cost for typical cut-and-cover construction. More open excavations with closed streets could therefore save considerable cost.
14. **Environmentally Sensitive Cut-and-Cover:** In this estimate, *Environmentally Sensitive* Cut-and-Cover has been allowed for by increasing cut-and-cover line construction cost by a factor of 1.05. This is to include improved quality decking and access restrictions on the contractor. In residential neighborhoods, this factor has been further increased to 1.15. This is assumed to cover the cost of significant work hour restrictions on the construction. It is planned to define the requirements in more detail and revise the estimates accordingly for the final estimate in early 1996.

15. **SPTC Walls:** During the Board of Consultants review meeting on September 14, 1995, it was decided certain SPTC walls could be converted to soil cement walls. This change has been incorporated resulting in substantially reducing the costs of Alternatives 2B and 2C.

ESTIMATE CRITERIA ATTACHMENTS

1. ***Market/Beale Terminal Alternatives and Segments***
2. ***Transbay Terminal Alternatives and Segments***
3. ***Description of Primary Alternatives***

APPENDICES

Additional explanatory information is included in Appendix A, Appendix B and Appendix C.

Appendix A includes important project definition tables as follows.

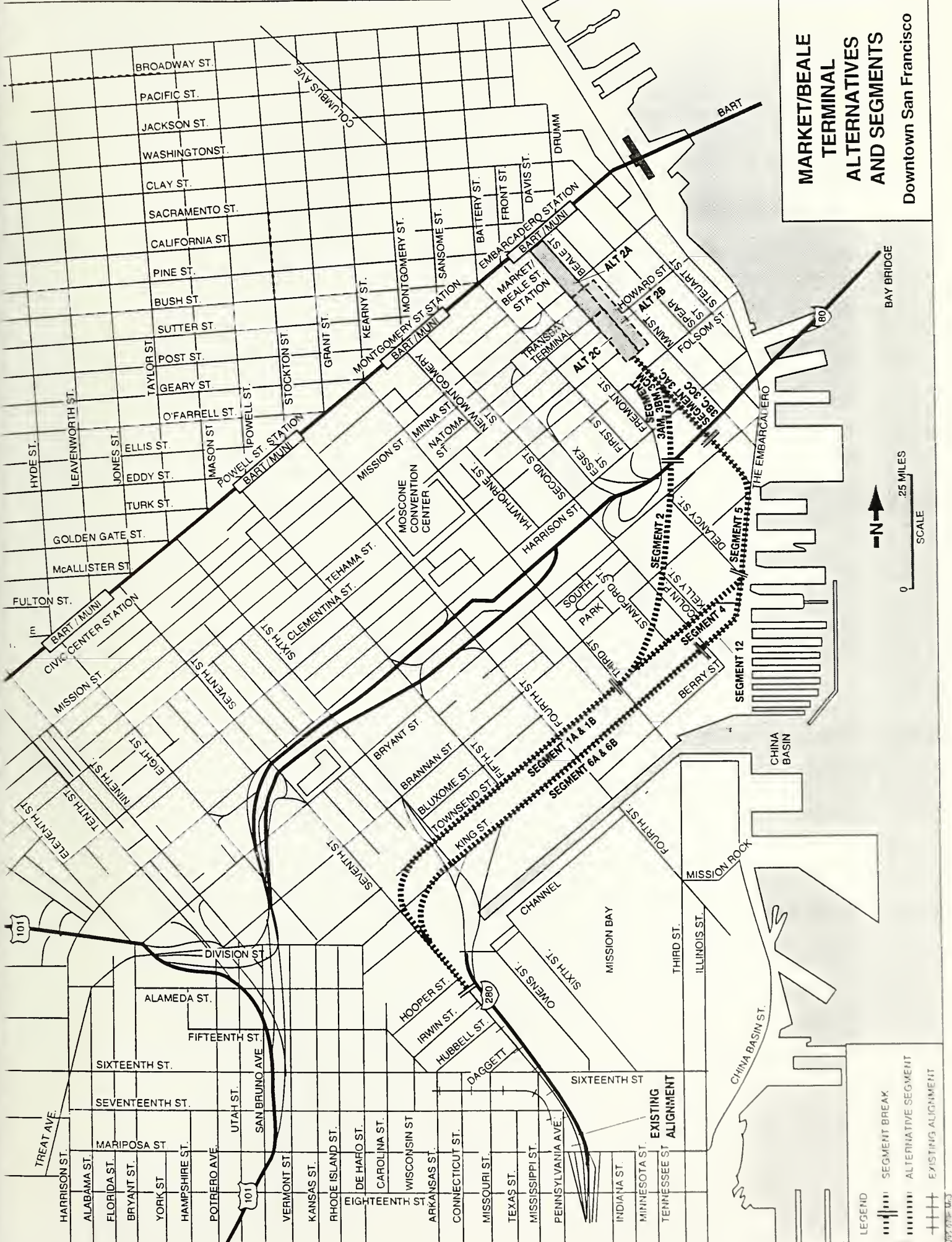
1. ***Segment Composition of Alternatives***
2. ***Segment Definition Table***
3. ***Alignment Schedule***

Appendix B includes the Underground Construction Board of Consultants report on geotechnical conditions and recommendations.

Additional reports are included in Appendix C. These reports include:

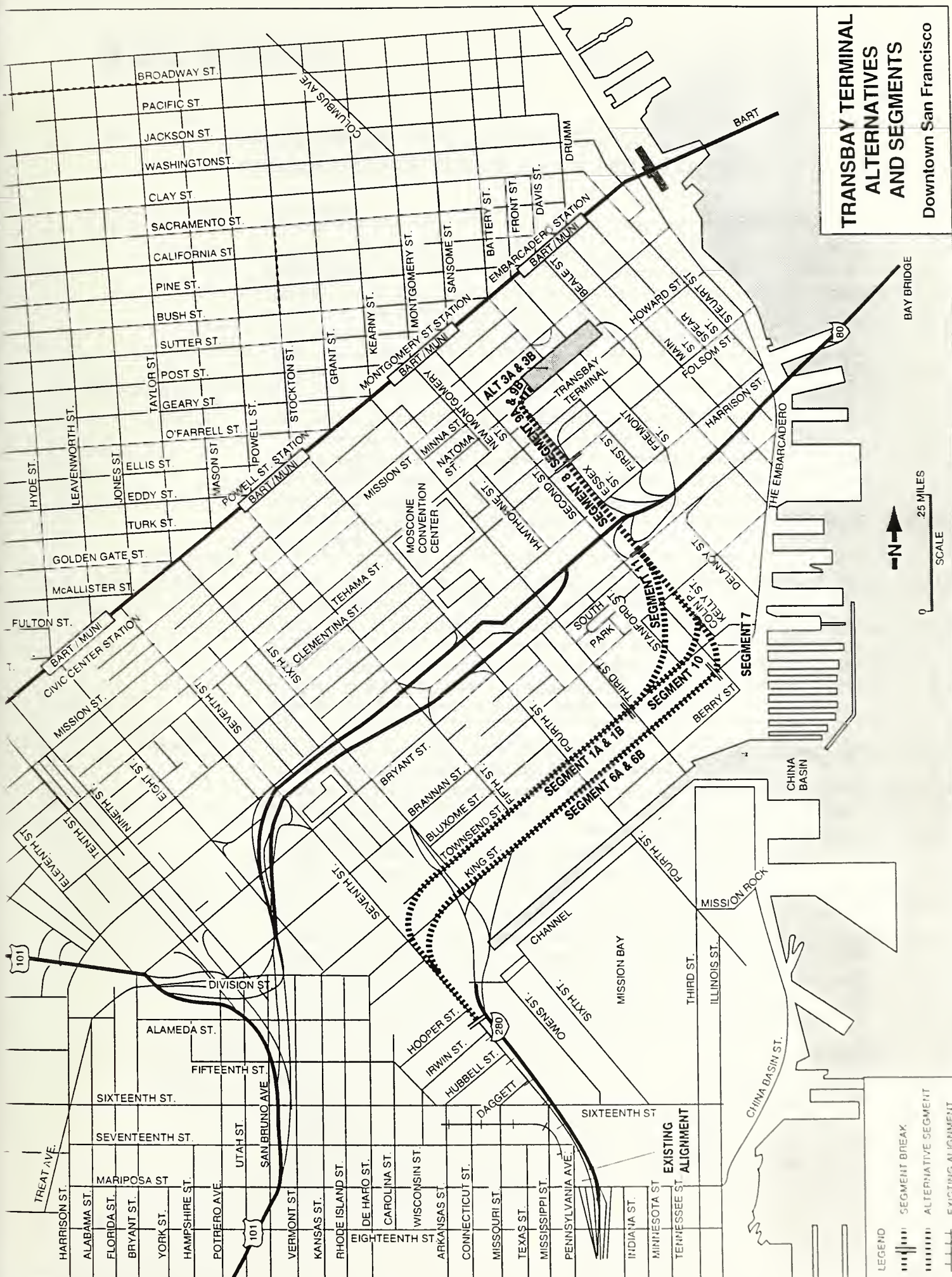
1. ***Capital Cost Estimate Methodology (for utility relocation/reinforcement)***
2. ***CalTrain Extension Ventilation System Cost Estimate***
3. ***CalTrain Signal System Assumptions***
4. ***Caltrain's Communications***

Downtown San Francisco



TRANSBAY TERMINAL ALTERNATIVES AND SEGMENTS

Downtown San Francisco



25 MILES
SCALE

- LEGEND
- SEGMENT BREAK
 - ALTERNATIVE SEGMENT
 - EXISTING ALIGNMENT

10/10/00

DESCRIPTION OF PRIMARY ALTERNATIVES MARKET/BEALE TERMINAL ALTERNATIVES

Alternative Number	Description
2A-CTD	New three-level, stacked, four-track center platform terminal located under Beale Street between Market and Howard Streets. Construction of rail alignment includes surface along Seventh from Berry to Townsend; surface along Townsend to portal at Fourth Street; cut-and-cover along Townsend from Fourth to the Embarcadero; environmentally sensitive cut-and-cover under Embarcadero to Beale; and cut-and-cover along Beale to the Market/Beale terminal. Locomotive propulsion is Clean Diesel.
2A-MTD	New three-level, stacked four-track side platform terminal located under Beale Street between Market and Howard Streets. Construction of rail alignment includes surface along Seventh from Berry to Townsend, surface along Townsend from Seventh to portal at Fourth Street; cut-and-cover along Townsend to Third Street; mined tunnel from Third and Townsend to Folsom and Beale; and cut-and-cover along Beale to the Market/Beale terminal. Locomotive propulsion is Clean Diesel.
2B-CTD	New two-level, four-track center platform staggered terminal located under Beale Street and Caltrans R/W east of Beale between Market and Folsom. Construction of rail alignment includes surface along Seventh Street from Berry to Townsend; surface along Townsend to portal at Fourth Street; cut-and-cover along Townsend from Fourth Street to the Embarcadero; environmentally sensitive cut-and-cover under Embarcadero to Beale; and cut-and-cover along Beale to the Market/Beale terminal. Locomotive propulsion is Clean Diesel.
2B-MTD	New two-level, four-track center platform staggered terminal located under Beale Street and Caltrans R/W east of Beale between Market and Folsom. Construction of rail alignment includes surface along Seventh Street from Berry to Townsend, surface along Townsend from Seventh Street to portal at Fourth Street; cut-and-cover along Townsend to Third; mined tunnel from Third and Townsend to Folsom and Beale; and cut-and-cover along Beale to the Market/Beale terminal. Locomotive propulsion is Clean Diesel.
2C-CTD	New two-level, four-track center platform terminal located under Beale Street and Caltrans R/W east of Beale between Mission and Folsom. Construction of rail alignment includes surface along Seventh Street from Berry to Townsend; surface along Townsend to portal at Fourth Street; cut-and-cover along Townsend from Fourth Street to the Embarcadero; environmentally sensitive cut-and-cover under Embarcadero to Beale; and cut-and-cover along Beale to the Market/Beale terminal. Locomotive propulsion to Clean Diesel.
2C-MTD	New two-level, four-track center platform terminal located under Beale Street and Caltrans R/W east of Beale between Mission and Folsom. Construction of rail alignment includes surface along Seventh Street from Berry to Townsend; surface along Townsend from Seventh Street to portal at Fourth Street; cut-and-cover along Townsend to Third; mined tunnel from Third and Townsend to Folsom and Beale; and cut-and-cover along Beale to the Market/Beale terminal. Locomotive propulsion is Clean Diesel.

**DESCRIPTION OF PRIMARY ALTERNATIVES
TRANSBAY TERMINAL ALTERNATIVES**

Alternative Number	Description
3A-CTD	New four-track, center platform Transbay Terminal with above ground train and bus access. Terminal is to be located on the site of the existing terminal. Construction of rail alignment includes surface along Seventh Street from Berry to Townsend, surface along Townsend to portal at Fourth Street, cut-and-cover along Townsend to Colin P. Kelly; cut-and-cover along Colin P. Kelly to Brannan; mined tunnel from Brannan to Folsom and Essex, then portal and begin aerial from Folsom to new Transbay Terminal. Locomotive propulsion is Clean Diesel.
3A-MTD	New four-track, center platform Transbay Terminal with above ground train and bus access. Terminal is to be located on the site of the existing terminal. Construction of rail alignment includes surface along Seventh Street from Berry to Townsend, surface along Townsend to portal at Fourth Street; cut-and-cover along Fourth Street to Third Street; mined tunnel on sweeping curve from Third to Folsom and Essex, then portal and begin aerial from Folsom to new Transbay Terminal. Locomotive propulsion is Clean Diesel.
3B-CTD	New four-track, center platform Transbay Terminal with below ground train access and above ground bus access. Terminal is to be located on the site of the existing terminal. Construction of rail alignment includes surface along Seventh Street from Berry to Townsend, surface along Townsend to portal at Fourth Street, cut-and-cover along Townsend to Colin P. Kelly; cut-and-cover along Colin P. Kelly to Brannan; mined tunnel from Brannan to Folsom and Essex, then cut-and-cover Folsom to new Transbay Terminal. Locomotive propulsion is Clean Diesel.
3B-MTD	New four-track, center platform Transbay Terminal with below ground train access and above ground bus access. Terminal is to be located on the site of the existing terminal. Construction of rail alignment includes surface along Seventh Street from Berry to Townsend, surface along Townsend to portal at Fourth Street; cut-and-cover along Fourth Street to Third Street; mined tunnel on sweeping curve from Third to Folsom and Essex, then cut-and-cover from Folsom to new Transbay Terminal. Locomotive propulsion is Clean Diesel.

CAPITAL COST ESTIMATES ^{(1),(2),(3),(4)}												
COST ELEMENTS	Market/Beale Alternative						Transbay Terminal Site Alternative					
	Three-Level Underground Station at Market			Two-Level Underground Station Staggered between Market and Mission			Two-Level Underground Station at Mission			Aerial Station		
	Cut-and-Cover Alignment	Mined Tunnel Alignment		Cut-and-Cover Alignment	Mined Tunnel Alignment		Cut-and-Cover Alignment	Mined Tunnel Alignment		Short Mined Tunnel Alignment	Long Mined Tunnel Alignment	Long Mined Tunnel Alignment
CalTrain Terminal	\$115,280	\$117,070		\$99,266	\$99,266		\$95,197	\$95,197		\$60,775	\$60,775	\$82,382
CalTrain Extension	223,827	213,597		150,771	152,943		137,005	138,784		125,544	133,789	146,890
Stework & Utilities	43,891	39,026		43,467	38,853		35,199	30,701		27,439	24,196	26,342
CalTrain System Elements	24,327	23,431		22,623	22,211		22,522	21,926		22,173	22,066	22,066
CalTrain Equipment Needs	47,875	47,875		47,875	47,875		47,875	47,875		47,875	47,875	47,875
Right-of-Way & Easements	13,166	17,109		13,166	17,109		6,166	10,109		9,242	7,331	7,331
Subtotal:	\$468,366	\$458,108		\$377,168	\$378,257		\$343,964	\$344,592		\$293,048	\$329,902	\$332,886
Design, CM, & Owner Costs	106,489	111,903		81,985	89,961		74,734	82,595		65,620	71,928	82,160
Contingency Allowance	116,531	115,179		93,354	94,759		84,018	85,341		78,171	79,519	91,959
Project Reserve (8%)	53,061	52,566		41,951	42,789		37,968	38,753		32,697	33,548	38,310
Total ⁽²⁾⁽³⁾	\$744,447	\$737,756		\$594,458	\$605,766		\$540,684	\$551,281		\$469,536	\$481,027	\$545,315
Bus Terminal & Ramps	150,000	150,000		150,000	150,000		150,000	150,000		100,000	100,000	120,000
GRAND TOTAL	\$894,447	\$887,756		\$744,458	\$755,766		\$690,684	\$701,281		\$569,536	\$581,027	\$665,315

(1) In thousands of dollars. (2) Full system electrification would cost about \$210,000,000 more. (3) The long tunnel option in Mission Bay would cost about \$93 million more. (4) The King Street Alignment option would cost about \$28-35 million more.

ALTERNATIVE COMPARISON: MB ALT - MARKET/BEALE TERMINAL ALTERNATIVES

DESCRIPTION	UNIT	ALT.: 2A CID	ALT.: 2A MID	ALT.: 2B CID	ALT.: 2B MID	ALT.: 2C CID	ALT.: 2C MID	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA															
ROUTE LENGTH	RF	10640	0	9700	0	10596	0	10026	0	9090	0	0	0	0	0
TRACK LENGTH	TF	43658	0	39760	0	38052	0	37612	0	35020	0	0	0	0	0
CONSTRUCTION COSTS															
SITE MODIFICATIONS:															
-DEVELOPMENT	RF	10641	2012	9701	1773	10597	2003	9701	1773	10027	1889	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	10641	26597	9701	22851	10597	25413	9701	21666	10027	22879	9091	1651	0	0
-STREET AND ROAD MODIFICATIONS	RF	10640	3632	9700	2402	10596	3501	9700	2014	10026	2881	9090	19129	0	0
-RAILROAD MODIFICATIONS	LS	2	1500	2	1500	2	1500	2	1500	2	1500	2	1500	0	0
-STRUCTURE MODIFICATIONS	LS	1	5000	1	5000	1	5500	1	5500	1	500	1	500	0	0
-UNDERPINNING	LS	1	3000	2	3500	1	2500	2	3500	1	2500	2	3500	0	0
-ENVIRONMENTAL MITIGATIONS	LS	3	2150	3	2000	3	3050	3	2900	3	3050	3	2900	0	0
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	1640	164	1640	164	1640	164	1640	164	1640	164	1640	164	0	0
TRACKWAY - RETAINED CUT	RF	920	7416	920	7416	920	7416	920	7416	920	7416	920	7416	0	0
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 2-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 4-TRACK RF	RF	1120	74683	1120	68803	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3271	68713	1390	28894	4421	96786	2540	56967	3781	81163	1960	42808	0	0
-CUT AND COVER (MESH/ROCK BOLTS)	RF	2484	57364	700	14928	2465	46405	700	12995	2565	48262	700	12995	0	0
-MINED TUNNEL & SPECIAL CONSTRUCTION RF	RF	125	15487	2850	93392	0	15487	0	2850	0	75401	0	75401	0	0
STATION - STRUCT/FINISH, APPROX. 1,100' EA	EA	1	115280	1	117070	1	99266	1	99266	1	95197	1	95197	0	0
TRACKWORK - BALLASTED	TF	15340	2302	15340	2302	15340	2302	15340	2302	15340	2302	15340	2302	0	0
TRACKWORK - DIRECT FIXATION	TF	28318	6513	24420	5617	22712	5224	20920	4812	22272	5123	19680	4527	0	0
SPECIAL TRACKWORK, TUNNELS, ETC.	LS	3	1795	3	1795	3	1380	3	1380	3	1380	3	1380	0	0
TRACTION POWER SYSTEM (SIS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WANSIDE AND STATION	LS	1	3376	1	3376	1	3376	1	3376	1	3376	1	3376	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	1	6639	1	6639	1	6639	1	6639	1	6639	1	6639	0	0
YARDS & SHOPS (SYSTEM WIDE)	EA	1	3702	1	3702	1	3702	1	3702	1	3702	1	3702	0	0
ROLLING STOCK (SYSTEM WIDE)	EA	25	45000	25	45000	25	45000	25	45000	25	45000	25	45000	0	0
LOCOMOTIVE CONVERSION/UPGRADE (SIS WIDE) EA	EA	23	2875	23	2875	23	2875	23	2875	23	2875	23	2875	0	0
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :			\$455200		\$440999		\$364002		\$361148		\$337798		\$334483		\$0
NON-CONSTRUCTION COSTS															
RIGHT OF WAY & RELOCATION	EA	5	13166	4	17109	5	13166	4	17109	5	6166	4	10109	0	0
ENGINEERING & MANAGEMENT	0	106489	0	111903	0	81985	0	89961	0	74734	0	82595	0	0	0
Subtotal NON-CONSTRUCTION COSTS :			\$119655		\$129012		\$95151		\$107070		\$80900		\$92704		\$0
CONTINGENCY	0	116531	0	115179	0	93354	0	94759	0	84018	0	85341	0	0	0
ESCALATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESCALATION (NOT INCLUDED)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE	0	53061	0	52566	0	41951	0	42789	0	37968	0	38753	0	0	0
PROJECT RESERVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :			\$744447		\$737756		\$594458		\$605766		\$540684		\$551281		\$0

ALTERNATIVE COMPARISON: TT ALT - TRANSBAY TERMINAL ALTERNATIVES

DESCRIPTION	UNIT	ALT. : 3A_CID	ALT. : 3A_MID	ALT. : 3B_CID	ALT. : 3B_MID	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA															
ROUTE LENGTH	RF	9800	0	9568	0	9568	0	9800	0	9568	0	0	0	0	0
TRACK LENGTH	TF	36200	0	35736	0	35736	0	36200	0	35736	0	0	0	0	0
CONSTRUCTION COSTS															
SITE MODIFICATIONS:															
-DEMOLITION	RF	6332	8895	0	8657	3952	8895	6332	8657	3952	8657	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	9801	12095	9569	9804	9801	13451	9569	11160	9569	11160	0	0	0	0
-STREET AND ROAD MODIFICATIONS	RF	8735	1449	6355	735	8735	1449	6355	735	6355	735	0	0	0	0
-RAILROAD MODIFICATIONS	LS	2	1500	2	1500	2	1500	2	1500	2	1500	0	0	0	0
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	1	1000	1	1000	2	1000	2	1000	2	1000	0	0	0	0
-ENVIRONMENTAL MITIGATIONS	LS	2	2500	2	2500	2	3290	2	3290	2	3290	0	0	0	0
TRACKWAY - AERIAL	RF	670	4824	670	4824	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	1640	164	1640	164	1640	164	1640	164	1640	164	0	0	0	0
TRACKWAY - RETAINED CUT	RF	1220	10261	1220	10261	920	7416	920	7416	920	7416	0	0	0	0
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 2-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 4-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390	28894	1390	28894	1390	28894	1390	28894	1390	28894	0	0	0	0
-CUT AND COVER (MESH/ROCK BOLTS)	RF	2295	44362	250	4641	2915	55872	870	16151	870	16151	0	0	0	0
-MINED TUNEL & SPECIAL CONSTRUCTION RF	RF	1400	37039	3213	85005	1750	46299	3563	94265	3563	94265	0	0	0	0
STATION - STRUCT/FINISH, APPROX. 1,100' EA	EA	1	60775	1	60775	1	82382	1	82382	1	82382	0	0	0	0
TRACKWORK - BALLASTED	TF	15340	2302	15340	2302	15340	2302	15340	2302	15340	2302	0	0	0	0
TRACKWORK - DIRECT FIXATION	TF	20860	4799	20396	4692	20860	4799	20396	4692	20396	4692	0	0	0	0
SPECIAL TRACKWORK, TUNNELS, ETC.	LS	3	1355	3	1355	3	1355	3	1355	3	1355	0	0	0	0
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	1	3376	1	3376	1	3376	1	3376	1	3376	0	0	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	1	6639	1	6639	1	6639	1	6639	1	6639	0	0	0	0
VAULTS & SHOPS (SYSTEM WIDE)	EA	1	3702	1	3702	1	3702	1	3702	1	3702	0	0	0	0
ROLLING STOCK (SYSTEM WIDE)	EA	25	45000	25	45000	25	45000	25	45000	25	45000	0	0	0	0
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)EA	EA	23	2875	23	2875	23	2875	23	2875	23	2875	0	0	0	0
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL CONSTRUCTION COSTS :			\$283806		\$288701		\$320660		\$325555		\$325555		\$0		\$0
NON-CONSTRUCTION COSTS															
RIGHT OF WAY & RELOCATION	EA	4	9242	4	7331	4	9242	4	7331	4	7331	0	0	0	0
ENGINEERING & MANAGEMENT	0	65620	0	71928	0	75852	0	75852	0	82160	0	0	0	0	0
SUBTOTAL NON-CONSTRUCTION COSTS :			\$74862		\$79259		\$85094		\$89491		\$89491		\$0		\$0
CONTINGENCY	0	78171	0	79519	0	90611	0	90611	0	91959	0	0	0	0	0
ESCALATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ESCALATION (NOT ROLLED)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE	0	32697	0	33548	0	37459	0	37459	0	38310	0	0	0	0	0
PROJECT RESERVE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :			\$469536		\$481027		\$533824		\$545315		\$545315		\$0		\$0



10/03/95
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**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
OTHER DESIGN OPTIONS COST SUMMARY**

OPTIONS, & Design Options Sreening (DOS) Report Decision #	SEGMENT	BASE COST	ALT. COST	ADDITIONAL COST	SAVINGS
<i>Option #1, EXTENDED SUBWAY ALONG TOWNSEND.</i>					
Option to extend cut-and-cover construction further along Townsend Street to portal near Seventh & Berry.					
Option corrisponds to DOS Decision #1					
BASE SEGMENT	1A	\$84,093,000			
ALTERNATIVE SEGMENT	1B		\$177,222,000		
ADDITIONAL COST/SAVINGS				\$93,129,000	

<i>Option #2, EXTENDED SUBWAY ALONG KING.</i>					
Option to extend cut-and-cover construction further along King Street to portal near Seventh & Berry.					
Option corrisponds to DOS Decision #1					
BASE SEGMENT	6A	\$141,521,000			
ALTERNATIVE SEGMENT	6B		\$191,649,000		
ADDITIONAL COST/SAVINGS				\$50,128,000	

<i>Option #3, KING STREET VERSUS TOWNSEND WITH SHORT SUBWAY TO MARKET/BEALE TERMINAL.</i>					
Option to access the Market/Beale Terminals via King Street with the King Street portal near Sixth St.					
Note that this option compares the two shorter cut-and-cover segments along King and Townsend to the Embarcadero					
Option Corresponds to DOS Decision #1					
BASE SEGMENT	1A	\$84,093,000			
BASE SEGMENT	4	\$67,728,000			
SEGMENT TOTAL		\$151,821,000			
ALTERNATIVE SEGMENT	6A		\$141,521,000		
ALTERNATIVE SEGMENT	12		\$38,619,000		
SEGMENT TOTAL			\$180,140,000		
ADDITIONAL COST/SAVINGS				\$28,319,000	



10/03/95
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**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
OTHER DESIGN OPTIONS COST SUMMARY**

OPTIONS, & Design Options Sreening (DOS) Report Decision #	SEGMENT	BASE COST	ALT. COST	ADDITIONAL COST	SAVINGS
<i>Option #4, KING STREET VERSUS TOWNSEND WITH LONG SUBWAY TO MARKET/BEALE TERMINAL.</i>					
Option to access the Market/Beale Terminals via King Street with the King Street portal near Seventh and Berry					
Note that this option compares the two longer cut-and-cover segments along King and Townsend to the Embarcadero					
Option Corresponds to DOS Decision #1					
ALTERNATIVE SEGMENT	1B	\$177,222,000			
BASE SEGMENT	4	\$67,728,000			
SEGMENT TOTAL		\$244,950,000			
ALTERNATIVE SEGMENT	6B		\$191,649,000		
ALTERNATIVE SEGMENT	12		\$38,619,000		
SEGMENT TOTAL			\$230,268,000		
ADDITIONAL COST/SAVINGS					\$14,682,000

<i>Option #5, KING STREET VERSUS TOWNSEND, SHORT SUBWAY TO TRANSBAY TERMINAL.</i>					
Option to access Transbay Terminal via King Street using cut-and-cover construction from King Street to Colin P. Kelly					
Option Corresponds to DOS Decision #1					
BASE SEGMENT	1A	\$84,093,000			
BASE SEGMENT	10	\$92,923,000			
SEGMENT TOTAL		\$177,016,000			
ALTERNATIVE SEGMENT	6A		\$141,521,000		
ALTERNATIVE SEGMENT	7		\$70,332,000		
SEGMENT TOTAL			\$211,853,000		
ADDITIONAL COST/SAVINGS				\$34,837,000	

<i>Option #6, KING STREET VERSUS TOWNSEND, LONG SUBWAY TO TRANSBAY TERMINAL.</i>					
Option to access Transbay Terminal via King Street using cut-and-cover construction from King Street to Colin P. Kelly					
Option Corresponds to DOS Decision #1					
ALTERNATIVE SEGMENT	1B	\$177,222,000			
BASE SEGMENT	10	\$92,923,000			
SEGMENT TOTAL		\$270,145,000			
ALTERNATIVE SEGMENT	6A		\$191,649,000		
ALTERNATIVE SEGMENT	7		\$70,332,000		
SEGMENT TOTAL			\$261,981,000		
ADDITIONAL COST/SAVINGS					\$8,164,000



10/03/95
BY BCC/RLM

**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
OTHER DESIGN OPTIONS COST SUMMARY**

OPTIONS, & Design Options Screening (DOS) Report Decision #	SEGMENT	BASE COST	ALT. COST	ADDITIONAL COST	SAVINGS
Option #7, PROPULSION/VENTILATION					
LNG locomotive propulsion in place of Clean Diesel.					
Option Corresponds to DOS Decision #7					
BASE SEGMENT	SW9	\$4,254,000			
ALTERNATIVE SEGMENT	SW5		\$3,348,000		
ALTERNATIVE SEGMENT	SW8		(\$1,487,000)		
ADDITIONAL COST/SAVINGS					\$2,393,000

Option #8, PROPULSION/VENTILATION					
Electric locomotive propulsion in place of Clean Diesel.					
Option Corresponds to DOS Decision #7					
BASE SEGMENT	SW9	\$4,254,000			
ALTERNATIVE SEGMENT	SW1		\$127,860,000		
ALTERNATIVE SEGMENT	SW6		\$82,999,000		
ADDITIONAL COST/SAVINGS				\$206,605,000	

Option #9, PROPULSION/VENTILATION					
Dual-Mode locomotive propulsion in place of Clean Diesel.					
Option Corresponds to DOS Decision #7					
BASE SEGMENT	SW9	\$4,254,000			
ALTERNATIVE SEGMENT	SW2		\$5,724,000		
ALTERNATIVE SEGMENT	SW7		\$145,256,000		
ADDITIONAL COST/SAVINGS				\$146,726,000	

Option #10, YARD LOCATION					
Bayshore Satellite Yard in place of Sixteenth Street Yard.					
Option Corresponds to DOS Decision #8					
BASE SEGMENT	SW3	\$13,485,000			
ALTERNATIVE SEGMENT	SW4		\$9,289,000		
ADDITIONAL COST/SAVINGS					\$4,196,000

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ALTERNATIVE: 2A_CTD - MARKET/BEALE TERM. - C&C SUBWAY - DIESEL. LOC.

DESCRIPTION	UNIT	SEC.: 1A	SEC.: 3AC	SEC.: 4	SEC.: 5	SEC.: SW3	SEC.: SW9	SEC.: SW10	QTY	COST	QTY	COST	QTY	COST	TOTALS	QTY	COST
SYSTEM DATA																	
ROUTE LENGTH	RF	3950	0	1830	0	1301	0	0	0	0	0	0	0	0	0	10640	0
TRACK LENGTH	TF	8700	0	4460	0	2602	0	12060	0	0	0	0	0	0	0	43658	0
CONSTRUCTION COSTS																	
SITE MODIFICATIONS:																	
-DEMOLITION	RF	3950	395	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950	8619	3559	712	1830	1301	1	500	0	0	0	0	0	0	10641	2012
-STREET AND ROAD MODIFICATIONS	RF	3950	494	3559	14400	1830	2921	1	47	0	0	0	0	0	0	10641	26597
-RAILROAD MODIFICATIONS	IS	1	1000	0	0	0	615	1301	0	0	0	0	0	0	0	10640	3632
-STRUCTURE MODIFICATIONS	IS	0	0	0	0	0	0	0	1	500	0	0	0	0	0	2	1500
-UNDERPINNING	IS	0	1	5000	0	0	0	0	0	0	0	0	0	0	0	1	5000
-ENVIRONMENTAL MITIGATIONS	IS	1	500	1	1500	0	0	0	0	0	0	0	0	0	0	1	3000
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	1640	164	0	0	0	0	0	0	0	0	0	0	0	0	1640	164
TRACKWAY - RETAINED CUT	RF	920	7416	0	0	0	0	0	0	0	0	0	0	0	0	920	7416
SUBWAY:																	
-CUT AND COVER (SEPT WALLS), 2-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 4-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390	28894	0	12278	1301	27541	0	0	0	0	0	0	0	0	1120	74683
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	1234	33514	1250	23850	0	0	0	0	0	0	0	0	2484	57364
-MINED TUNEL & SPECIAL CONSTRUCTION RF	RF	0	0	125	15487	0	0	0	0	0	0	0	0	0	0	125	15487
STATION - STRUCT/FINISH, APPROX. 1,100' EA	EA	0	0	1	115280	0	0	0	0	0	0	0	0	0	0	1	115280
TRACKWORK - BALLASTED	TF	3280	433	0	0	0	0	12060	1869	0	0	0	0	0	0	15340	2302
TRACKWORK - DIRECT FIXATION	TF	5420	1247	15836	3642	4460	1026	2602	598	0	0	0	0	0	0	28318	6513
SPECIAL TRACKWORK, TUNNELS, ETC.	LS	1	350	1	850	0	0	1	595	0	0	0	0	0	0	3	1795
TRACTION POWER SYSTEM (SIS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YARDS & SHOPS (S/SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROLLING STOCK (SYSTEM WIDE)	EA	0	0	0	0	0	0	1	3702	0	0	0	0	0	0	1	6639
LOCOMOTIVE CONVERSION/UPGRADE (SIS WIDE) EA	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS:			\$49512	\$270203	\$41115	\$29267	\$7213	\$2875	\$55015	\$0	\$0	\$0	\$0	\$0	\$0	\$455200	
NON-CONSTRUCTION COSTS																	
RIGHT OF WAY & RELOCATION	EA	1	1751	1	447	1	2666	1	1000	0	0	0	0	0	0	5	13166
ENGINEERING & MANAGEMENT	0	0	12553	0	10323	0	7583	0	1903	0	288	0	0	0	0	0	106489
Subtotal NON-CONSTRUCTION COSTS:			\$14304	\$77287	\$10770	\$10249	\$2903	\$288	\$3854	\$0	\$0	\$0	\$0	\$0	\$0	\$119655	
CONTINGENCY																	
CONTINGENCY	0	0	14048	0	10826	0	8171	0	2370	0	776	0	0	0	0	0	116531
ESCALATION																	
ESCALATION (NOT INCLUDED)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																	
PROJECT RESERVE	0	0	6229	0	5017	0	3815	0	999	0	315	0	0	0	0	0	53061
TOTAL:			\$84093	\$453659	\$67728	\$51502	\$13485	\$4254	\$69726	\$0	\$0	\$0	\$0	\$0	\$0	\$744447	

DESCRIPTION	UNIT	SEG. : 1A		SEG. : 2		SEG. : 3M		SEG. : SAK		SEG. : SAK		SEG. : SAK		SEG. : SAK		TOTALS	
		QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																	
ROUTE LENGTH	RF	3950	0	2720	0	3030	0	0	0	0	0	0	0	0	0	9700	0
TRACK LENGTH	TF	8700	0	5440	0	13560	0	12060	0	0	0	0	0	0	0	39760	0
CONSTRUCTION COSTS																	
SITE MODIFICATIONS:																	
-DEVOLITION	RF	3950	395	2720	272	3030	606	1	500	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950	8619	2720	495	3030	13690	1	47	0	0	0	0	0	0	9701	1773
-STREET AND ROAD MODIFICATIONS	RF	3950	494	2720	90	3030	1818	0	0	0	0	0	0	0	0	9700	22851
-RAILROAD MODIFICATIONS	LS	1	1000	0	0	0	0	1	500	0	0	0	0	0	0	2	1500
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	1	5000	0	0	0	0	0	0	0	0	1	5000
-UNDERPINNING	LS	0	0	1	1500	0	2000	0	0	0	0	0	0	0	0	2	3500
-ENVIRONMENTAL MITIGATIONS	LS	1	500	1	0	1	1500	0	0	0	0	0	0	0	0	3	2000
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	1640	164	0	0	0	0	0	0	0	0	0	0	0	0	1640	164
TRACKWAY - RETAINED CUT	RF	920	7416	0	0	0	0	0	0	0	0	0	0	0	0	920	7416
SUBWAY	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS) , 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS) , 4-TRACK	RF	0	0	0	0	1120	68803	0	0	0	0	0	0	0	0	1120	68803
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390	28894	0	0	0	0	0	0	0	0	0	0	0	0	1390	28894
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	550	10210	150	4718	0	0	0	0	0	0	0	0	700	14928
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	0	0	2170	57411	680	35981	0	0	0	0	0	0	0	0	2850	93392
STATION - STRICT-FINISH, APPROX. 1,100'	EA	0	0	0	0	1	117070	0	1869	0	0	0	0	0	0	1	117070
TRACKWORK - BALLASTED	TF	3280	433	0	0	0	0	12060	0	0	0	0	0	0	0	15340	2302
TRACKWORK - DIRECT FIXATION	TF	5420	1247	5440	1251	13560	3119	0	0	0	0	0	0	0	0	24420	5617
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	350	0	0	1	850	1	595	0	0	0	0	0	0	3	1795
TRACTION POWER SYSTEM (SIS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WANSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	1	3376	0	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	1	6639	0	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	1	3702	0	0	0	0	0	0	1	3702
ROLLING STOCK (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	25	45000	0	0	0	25	45000
LOCOMOTIVE CONVERSION/UPGRADE (SIS WIDE)	EA	0	0	0	0	0	0	0	0	23	2875	0	0	0	0	23	2875
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :			\$49512		\$71229		\$255155		\$7213		\$2875		\$55015		\$0		\$440999
NON-CONSTRUCTION COSTS																	
RIGHT OF WAY & RELOCATION	EA	1	1751	1	3823	1	10535	1	1000	0	0	0	0	0	0	4	17109
ENGINEERING & MANAGEMENT		0	12553	0	24505	0	68800	0	1903	0	288	0	3854	0	0	0	111903
Subtotal NON-CONSTRUCTION COSTS :			\$14304		\$28328		\$79335		\$2903		\$288		\$3854		\$0		\$129012
CONTINGENCY																	
CONTINGENCY	0	14048	0	20312	0	69898	0	2370	0	776	0	7775	0	0	0	0	115179
ESCALATION																	
ESCALATION (NOT INCLUDED)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																	
PROJECT RESERVE	0	6229	0	9590	0	32351	0	999	0	315	0	3082	0	0	0	0	52566
TOTAL :		\$84093		\$129459		\$436739		\$13485		\$4254		\$69726		\$0			\$737756

ALTERNATIVE: 2B_CTD - MARKET/BEALE TERM. - C&C STAGGERED - DIESEL. LOC.

DESCRIPTION	SEG.: 1A		SEG.: 3BC		SEG.: 4		SEG.: 5		SEG.: SW3		SEG.: SW9		SEG.: SW10		TOTALS	
	UNIT	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	COST
SYSTEM DATA																
ROUTE LENGTH	RF	3950	0	3515	0	1830	0	1301	0	0	0	0	0	0	0	0
TRACK LENGTH	TF	8700	0	10230	0	4460	0	2602	0	12060	0	0	0	0	0	0
CONSTRUCTION COSTS																
SITE MODIFICATIONS:																
-DEMOLITION	RF	3950	0	395	0	0	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950	8619	3515	13216	1830	2921	1301	610	1	500	0	0	0	0	0
-STREET AND ROAD MODIFICATIONS	RF	3950	494	3515	2004	1830	615	1301	388	0	0	0	0	0	0	0
-RAILROAD MODIFICATIONS	LS	1	1000	0	0	0	0	0	0	1	500	0	0	0	0	0
-STRUCTURE MODIFICATIONS	LS	0	0	1	5500	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	2500	0	0	0	0	0	0	0	0	0	0	0
-ENVIRONMENTAL MITIGATIONS	LS	1	500	1	2400	1	150	0	0	0	0	0	0	0	0	0
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	1640	164	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - RETAINED CUT	RF	920	7416	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBWAY:																
-CUT AND COVER (SEPT WALLS), 2-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 4-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CORRET WALLS)	RF	1390	28894	1150	28073	580	12278	1301	27541	0	0	0	0	0	0	0
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	1215	22555	1250	23850	0	0	0	0	0	0	0	0	0
-MINED TUNEL & SPECIAL CONSTRUCTION	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STATION - STRUCT/FINISH, APPROX. 1,100' EA	EA	0	0	1	99266	0	0	0	0	0	0	0	0	0	0	0
TRACKWORK - BALLAST	TF	3280	433	10230	2353	4460	1026	2602	598	0	1869	0	0	0	0	0
TRACKWORK - DIRECT FIXATION	TF	5420	1247	0	0	0	0	0	0	12060	0	0	0	0	0	0
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	350	1	435	0	0	0	0	1	595	0	0	0	0	0
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ROLLING STOCK (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	1	3702	0	0	0	0	0
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE) EA	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :			\$49512	\$179005	\$41115	\$29267	\$7213	\$2875	\$55015	\$0	\$0	\$0	\$0	\$0	\$0	\$364002
NON-CONSTRUCTION COSTS																
RIGHT OF WAY & RELOCATION	EA	1	1751	1	7302	1	447	1	2666	1	1000	0	0	0	0	0
ENGINEERING & MANAGEMENT	EA	0	12553	0	45481	0	10323	0	7583	0	288	0	0	0	0	0
Subtotal NON-CONSTRUCTION COSTS :			\$14304	\$52783	\$10770	\$10249	\$2903	\$288	\$3854	\$0	\$3854	\$0	\$0	\$0	\$0	\$95151
CONTINGENCY																
CONTINGENCY	EA	0	14048	0	49388	0	10826	0	8171	0	776	0	7775	0	0	0
ESCALATION																
ESCALATION (COT INCLUDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																
PROJECT RESERVE	EA	0	6229	0	22494	0	5017	0	3815	0	315	0	3082	0	0	0
TOTAL :			\$94093	\$303670	\$67728	\$51502	\$13485	\$4254	\$69726	\$0	\$0	\$0	\$0	\$0	\$0	\$594458

05, 5 20:11:32 BY: BOC/RUM
ALL COSTS IN \$1,000'S

DESCRIPTION	UNIT	SEG.: 1A		SEG.: 2		SEG.: 3EM		SEG.: SW3		SEG.: SW9		SEG.: SW10		COST	QTY	COST	TOTALS
		QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST				
SYSTEM DATA																	
ROUTE LENGTH	RF	3950	0	2720	0	3030	0	0	0	0	0	0	0	0	0	9700	0
TRACK LENGTH	TF	8700	0	5440	0	10060	0	12060	0	0	0	0	0	0	0	36260	0
CONSTRUCTION COSTS																	
SITE MODIFICATIONS:																	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950	395	2720	272	3030	605	1	500	0	0	0	0	0	0	0	0
-STREET AND ROAD MODIFICATIONS	RF	3950	8619	2720	495	3030	12505	1	47	0	0	0	0	0	0	9701	1773
-RAILROAD MODIFICATIONS	LS	1	1000	0	90	3030	1430	0	500	0	0	0	0	0	0	9700	21666
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	1	5500	0	1	500	0	0	0	0	0	2	1500
-UNDERPINNING	LS	0	0	1	1500	1	2000	0	0	0	0	0	0	0	0	1	5500
-ENVIRONMENTAL MITIGATIONS	LS	1	500	1	0	1	2400	0	0	0	0	0	0	0	0	2	3500
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2900
TRACKWAY - AT GRADE	RF	1640	164	0	0	0	0	0	0	0	0	0	0	0	0	1640	164
TRACKWAY - RETAINED CUT	RF	920	7416	0	0	0	0	0	0	0	0	0	0	0	0	920	7416
SUBWAY:																	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390	28894	0	0	1150	28073	0	0	0	0	0	0	0	0	2540	56967
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	550	10210	150	2785	0	0	0	0	0	0	0	0	700	12995
-MINED TUNEL & SPECIAL CONSTRUCTION	RF	0	0	2170	57411	680	17990	0	0	0	0	0	0	0	0	2850	75401
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	0	0	0	0	1	99266	0	0	0	0	0	0	0	0	1	99266
TRACKWORK - BALLASTED	TF	3280	433	0	0	0	1869	0	0	0	0	0	0	0	0	15340	2302
TRACKWORK - DIRECT FIXATION	TF	5420	1247	5440	1251	10060	2314	0	0	0	0	0	0	0	0	20920	4812
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	350	0	0	1	435	1	595	0	0	0	0	0	0	3	1380
TRACTION POWER SYSTEM (SIS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	1	3376	0	0	0	1	3376	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	1	6639	0	0	0	1	6639	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3702
ROLLING STOCK (SYSTEM WIDE)	EA	0	0	0	0	0	1	3702	0	0	0	0	0	0	0	25	45000
LOCOMOTIVE CONVERSION/UPGRADE (SIS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	2875
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	23	2875	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPECIAL CONSTRUCTION COSTS :																	
		\$49512		\$71229		\$175304	\$7213		\$55015		\$2875		\$0		\$0		\$361148
NON-CONSTRUCTION COSTS																	
RIGHT OF WAY & RELOCATION	EA	1	1751	1	3823	1	10535	1	1000	0	0	0	0	0	0	4	17109
ENGINEERING & MANAGEMENT		0	12553	0	24505	0	46858	0	1903	0	288	0	0	0	0	0	89561
SPECIAL NON-CONSTRUCTION COSTS :																	
			\$14304		\$28328		\$57393		\$2903		\$288		\$0		\$0		\$107070
CONTINGENCY																	
CONTINGENCY		0	14048	0	20312	0	49478	0	2370	0	776	0	0	0	0	0	94759
ESCALATION																	
ESTIMATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																	
PROJECT RESERVE		0	6229	0	9590	0	22574	0	999	0	315	0	0	0	0	0	42789
TOTAL :																	
		\$84093		\$129459		\$304749	\$13485		\$69726		\$4254		\$0		\$0		\$605766

ALTERNATIVE: 2C_CTD - MISSION/FOLSOM - C&C - DIESEL LOCOMOTIVE

[illegible]

DESCRIPTION	UNIT	SEG. : 1A		SEG. : 2		SEG. : 30M		SEG. : SV3		SEG. : SV9		SEG. : SM10		TOTALS	
		QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA															
ROUTE LENGTH	RF	3950	0	2720	0	2420	0	0	0	0	0	0	0	0	9090
TRACK LENGTH	TF	8700	0	5440	0	8820	0	12060	0	0	0	0	0	0	35020
CONSTRUCTION COSTS															
SITE MODIFICATIONS:															
-DEMOLITION	RF	3950	395	2720	272	2420	484	1	500	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950	8619	2720	495	2420	9968	1	47	0	0	0	0	0	9091
-STREET AND ROAD MODIFICATIONS	RF	3950	494	2720	90	2420	937	0	0	0	0	0	0	0	9091
-RAILROAD MODIFICATIONS	LS	1	1000	0	0	0	500	0	500	0	0	0	0	0	2
-STRUCTURE MODIFICATIONS	LS	0	0	0	1	500	0	0	0	0	0	0	0	0	1
-UNDERPINNING	LS	0	0	1	1500	1	2000	0	0	0	0	0	0	0	500
-ENVIRONMENTAL MITIGATIONS	LS	1	500	1	1	1	2400	0	0	0	0	0	0	0	2
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	1640	164	0	0	0	0	0	0	0	0	0	0	0	164
TRACKWAY - RETAINED CUT	RF	920	7416	0	0	0	0	0	0	0	0	0	0	0	920
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 2-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 4-TRACK RF	RF	1390	28894	0	0	570	13914	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	0	0	550	10210	150	2785	0	0	0	0	0	0	0	1960
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	2170	57411	680	17990	0	0	0	0	0	0	0	700
-ATTACHED TUNNEL & SPECIAL CONSTRUCTION	RF	0	0	0	0	0	17990	0	0	0	0	0	0	0	2850
STATION - STRICT/FINISH, APPROX. 1,100' EA	EA	0	0	0	0	1	95197	0	0	0	0	0	0	0	1
TRACKWORK - BALLASTED	TF	3280	433	0	0	0	1869	0	1869	0	0	0	0	0	15340
TRACKWORK - DIRECT FIXATION	TF	5420	1247	5440	1251	8820	2029	0	0	0	0	0	0	0	2302
SPECIAL TRACKWORK, TURNOUS, ETC.	LS	1	350	0	0	1	435	1	595	0	0	0	0	0	4527
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	3
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ROLLING STOCK (SYSTEM WIDE)	EA	0	0	0	0	0	3702	0	0	0	0	0	0	0	3702
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	25
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	23	2875	0	0	0	2875
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :			\$49512		\$71229		\$148639		\$7213		\$2875		\$55015		\$334483
NON-CONSTRUCTION COSTS															
RIGHT OF WAY & RELOCATION	EA	1	1751	1	3823	1	3535	1	1000	0	0	0	0	0	4
ENGINEERING & MANAGEMENT	0	0	12553	0	24505	0	39492	0	1903	0	288	0	3854	0	0
Subtotal NON-CONSTRUCTION COSTS :			\$14304		\$28328		\$43027		\$2903		\$288		\$3854		\$92704
CONTINGENCY															
CONTINGENCY	0	0	14048	0	20312	0	40060	0	2370	0	776	0	7775	0	85341
ESCALATION															
ESCALATION (NOT INCLUDED)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE															
PROJECT RESERVE	0	0	6229	0	9590	0	18538	0	999	0	315	0	3082	0	38753
TOTAL :															

ALTERNATIVE: 3A_CTD - TTT - ABOVE GROUND - C&C - DIESEL LOCOMOTIVES

DESCRIPTION	UNIT	SEG.: 1A		SEG.: 8		SEG.: 9A		SEG.: 10		SEG.: S43		SEG.: S49		SEG.: S410		QTY	COST	TOTALS	QTY	COST																			
		QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST																								
SYSTEM DATA																																							
ROUTE LENGTH	RF	3950		0	1065	0	2405	0	2380	0	0	0	0	0	0	0	0	9800	0																				
TRACK LENGTH	TF	8700		0	2130	0	8550	0	4760	0	12060	0	0	0	0	0	0	36200	0																				
CONSTRUCTION COSTS																																							
SITE MODIFICATIONS:																																							
-DEVELOPMENT	RF	3950	395	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6332	8895	0																			
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950	8619	1065	144	2405	498	2380	2787	1	500	0	0	0	0	0	0	9801	12095	0																			
-STREET AND ROAD MODIFICATIONS	RF	3950	494	0	0	2405	0	2380	714	0	0	0	0	0	0	0	0	8735	1449	0																			
-RAILROAD MODIFICATIONS	LS	1	1000	0	0	0	0	0	0	1	500	0	0	0	0	0	0	2	1500	0																			
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
-UNDERPINNING	LS	0	0	0	0	0	0	0	1	1000	0	0	0	0	0	0	0	1	1000	0																			
-ENVIRONMENTAL MITIGATIONS	LS	1	500	0	0	1	2000	0	0	0	0	0	0	0	0	0	0	2	2500	0																			
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	4824	0	0	0	0	0	0	0	0	670	4824	0																			
TRACKWAY - AT GRADE	RF	1640	164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1640	164	0																			
TRACKWAY - RETAINED CUT	RF	920	7416	0	0	300	2845	0	0	0	0	0	0	0	0	0	0	1220	10261	0																			
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
-CUT AND COVER (SEPT WALLS), 2-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
-CUT AND COVER (SEPT WALLS), 4-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390	28894	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1390	28894	0																			
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	250	28176	0	4641	2045	39721	0	0	0	0	0	0	2295	44362	0																			
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	0	0	0	1065	0	0	0	8863	0	0	0	0	0	0	0	0	1400	37039	0																			
-TUNNEL TREATMENT & SPECIAL CONSTRUCTION	RF	0	0	0	0	1	60775	0	0	0	0	0	0	0	0	0	0	1	60775	0																			
STATION - STRICTLY FINISH, APPROX. 1,100' EA	EA	3280	433	0	0	0	0	0	0	0	12060	0	0	0	0	0	0	15340	2302	0																			
TRACKWORK - BALLASTED	TF	5420	1247	2130	490	8550	1967	4760	1095	0	0	0	0	0	0	0	0	20860	4799	0																			
TRACKWORK - DIRECT FIXATION	TF	5420	1247	2130	490	8550	1967	4760	1095	0	0	0	0	0	0	0	0	20860	4799	0																			
SPECIAL TRACKWORK, TUNNELS, ETC.	LS	1	350	0	0	1	410	0	0	1	595	0	0	0	0	0	0	3	1355	0																			
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0																			
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0																			
VAROS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	1	3702	0	0	0	0	0	0	1	3702	0																			
ROLLING STOCK (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	45000	0																			
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)EA	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	2875	0																			
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
Subtotal CONSTRUCTION COSTS :																					\$0	\$2875	\$55015	\$0	\$0	\$283806													
NON-CONSTRUCTION COSTS																																							
RIGHT OF WAY & RELOCATION	EA	1	1751	0	0	1	4500	1	1991	1	1000	0	0	0	0	0	0	4	9242	0																			
ENGINEERING & MANAGEMENT	0	0	12553	0	10302	0	21941	0	14779	0	1903	0	0	0	0	0	0	0	65620	0																			
Subtotal NON-CONSTRUCTION COSTS :																					\$0	\$288	\$3854	\$0	\$0	\$74862													
CONTINGENCY																																							
CONTINGENCY	0	0	14048	0	7812	0	30538	0	14852	0	2370	0	776	0	7775	0	0	0	78171	0																			
ESCALATION																																							
ESCALATION (NOT INCLUDED)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
PROJECT RESERVE																																							
PROJECT RESERVE	0	0	6229	0	3754	0	11435	0	6883	0	999	0	315	0	3082	0	0	0	32697	0																			
TOTAL :																					\$0	\$4254	\$69726	\$0	\$0	\$469536													

ALTERNATIVE: 3A_MTD - TTT - ABOVE GROUND - MINED - DIESEL LOCOMOTIVES

DESCRIPTION	UNIT	SEC. : 1A		SEC. : 8		SEC. : 9A		SEC. : 11		SEC. : 5A3		SEC. : 5A9		SEC. : 5A10		TOTALS	
		QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																	
ROUTE LENGTH	RF	3950	0	1065	0	2405	0	2148	0	0	0	0	0	0	0	9568	0
TRACK LENGTH	TF	8700	0	2130	0	8550	0	4296	0	12060	0	0	0	0	0	35736	0
CONSTRUCTION COSTS																	
SITE MODIFICATIONS:																	
-DEMOLITION	RF	3950	395	0	0	0	7762	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950	8619	1065	144	2405	498	2148	496	1	500	0	0	0	0	3952	8657
-STREET AND ROAD MODIFICATIONS	RF	3950	494	0	0	2405	241	0	0	0	0	0	0	0	0	9569	9804
-RAILROAD MODIFICATIONS	LS	1	1000	0	0	0	0	0	0	1	500	0	0	0	0	6355	735
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1500
-UNDERPINNING	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-ENVIRONMENTAL MITIGATIONS	LS	1	500	0	0	1	2000	0	1	1000	0	0	0	0	0	1	1000
TRACKWAY - AERIAL	RF	0	0	0	0	670	4824	0	0	0	0	0	0	0	0	2	2500
TRACKWAY - AT GRADE	RF	1640	164	0	0	0	0	0	0	0	0	0	0	0	0	670	4824
TRACKWAY - RETAINED CUT	RF	920	7416	0	0	300	2845	0	0	0	0	0	0	0	0	1640	164
SUBWAY:																	
-CUT AND COVER (SPIC WALLS) , 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPIC WALLS) , 4-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390	28894	0	0	0	0	0	0	0	0	0	0	0	0	1390	28894
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	250	4641	0	0	0	0	0	0	0	0	250	4641
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	0	0	1065	28176	0	0	2148	56829	0	0	0	0	0	0	3213	85005
STATION - SURFCTY/FINISH, APPROX. 1,100' EA	EA	0	0	0	0	1	60775	0	0	0	0	0	0	0	0	1	60775
TRACKWORK - BALLASTED	TF	3280	433	0	0	0	0	0	0	12060	1869	0	0	0	0	15340	2302
TRACKWORK - DIRECT FIXATION	TF	5420	1247	2130	490	8550	1967	4296	988	0	0	0	0	0	0	20396	4692
SPECIAL TRACKWORK, TUNNELS, ETC.	LS	1	350	0	0	1	410	0	0	1	595	0	0	0	0	3	1355
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	1	3376	1	3376	
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	1	6639	1	6639	
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	1	3702	0	0	0	1	3702	0
ROLLING STOCK (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	25	45000	25	45000	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	2875
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :																	
			\$49512		\$28810		\$85963		\$59313		\$7213		\$2875		\$55015	\$0	\$288701
NON-CONSTRUCTION COSTS																	
RIGHT OF WAY & RELOCATION	EA	1	1751	0	0	1	4500	1	80	1	1000	0	0	0	0	4	7331
ENGINEERING & MANAGEMENT	0	12553	0	10302	0	21941	0	21087	0	1903	0	288	0	3854	0	0	71928
Subtotal NON-CONSTRUCTION COSTS :																	
			\$14304		\$10302		\$26441		\$21167		\$2903		\$288		\$3854	\$0	\$79259
CONTINGENCY																	
CONTINGENCY	0	14048	0	7812	0	30538	0	16200	0	2370	0	776	0	7775	0	0	79519
ESCALATION																	
ESCALATION (CUT INCLUDED)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																	
PROJECT RESERVE	0	6229	0	3754	0	11435	0	7734	0	999	0	315	0	3082	0	0	33548
TOTAL :																	
			\$94093		\$50678		\$154377		\$104414		\$13485		\$4254		\$69726	\$0	\$481027

ALTERNATIVE: 3B_CTD - TTT - BELOW GND - C&C - DIESEL LOCOMOTIVES

DESCRIPTION	UNIT	SEG.: 1A		SEG.: 8		SEG.: 9B		SEG.: 10		SEG.: S4G		SEG.: S49		SEG.: S410		TOTALS	
		QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																	
ROUTE LENGTH	RF	3950	0	1065	0	2405	0	2380	0	0	0	0	0	0	0	9600	0
TRACK LENGTH	TF	8700	0	2130	0	8550	0	4760	0	12060	0	0	0	0	0	36200	0
CONSTRUCTION COSTS																	
SITE MODIFICATIONS:																	
-DEMOLITION	RF	3950	395	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950	8619	1065	144	2405	1854	2380	2787	1	500	0	0	0	0	6332	8895
-STREET AND ROAD MODIFICATIONS	RF	3950	494	0	0	2405	241	2380	714	0	47	0	0	0	0	9601	13451
-RAILROAD MODIFICATIONS	LS	1	1000	0	0	0	0	0	0	1	500	0	0	0	0	8735	1449
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1500
-UNDERPINNING	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-ENVIRONMENTAL MITIGATIONS	LS	1	500	0	0	1	2790	0	1	1000	0	0	0	0	0	2	1000
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	1640	164	0	0	0	0	0	0	0	0	0	0	0	0	1640	164
TRACKWAY - RETAINED CUT	RF	920	7416	0	0	0	0	0	0	0	0	0	0	0	0	920	7416
SUBWAY:																	
-CUT AND COVER (SEPT WALLS), 2-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SEPT WALLS), 4-TRACK RF	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390	28894	0	0	0	0	0	0	0	0	0	0	0	0	1390	28894
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	1065	28176	350	9260	335	8863	0	0	0	0	0	0	2915	55872
-MINED TUNNEL & SPECIAL CONSTRUCTION RF	RF	0	0	0	0	1	82382	0	0	0	0	0	0	0	0	1750	46299
STATION - STRUCT/FINISH, APPROX. 1,100' EA	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	82382
TRACKWORK - BALLASTED	TF	3280	433	0	0	0	0	0	0	12060	1869	0	0	0	0	15340	2302
TRACKWORK - DIRECT FIXATION	TF	5420	1247	2130	490	8550	1967	4760	1095	0	0	0	0	0	0	20860	4799
SPECIAL TRACKWORK, TURNOUS, ETC.	LS	1	350	0	0	1	410	0	1	595	0	0	0	0	0	3	1355
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	1	3702	0	0	0	0	1	3702
ROLLING STOCK (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	45000
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)EA	EA	0	0	0	0	0	0	0	0	0	0	23	2875	0	0	23	2875
DIESEL LOCOMOTIVE SALVAGE	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS SP	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :																	
			\$49512		\$28810		\$122817		\$54418		\$7213		\$2875		\$55015	\$0	\$320660
NON-CONSTRUCTION COSTS																	
RIGHT OF WAY & RELOCATION	EA	1	1751	0	0	1	4500	1	1991	1	1000	0	0	0	0	4	9242
ENGINEERING & MANAGEMENT		0	12553	0	10302	0	32173	0	14779	0	1903	0	288	0	3854	0	75852
Subtotal NON-CONSTRUCTION COSTS :																	
			\$14304		\$10302		\$36673		\$16770		\$2903		\$288		\$3854	\$0	\$85094
CONTINGENCY																	
CONTINGENCY		0	14048	0	7812	0	42978	0	14852	0	2370	0	776	0	7775	0	90611
ESCALATION																	
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																	
PROJECT RESERVE		0	6229	0	3754	0	16197	0	6883	0	999	0	315	0	3082	0	37459
TOTAL :																	
			\$94093		\$50678		\$218665		\$92923		\$13485		\$4254		\$69726	\$0	\$533824

ALTERNATIVE: 3B_MTD - TTY - BELOW GND - MINED - DIESEL LOCOMOTIVES

DESCRIPTION	UNIT	SEG. : 1A	QTY	COST	SEG. : 8	QTY	COST	SEG. : 9B	QTY	COST	SEG. : 11	QTY	COST	SEG. : S43	QTY	COST	SEG. : S49	QTY	COST	SEG. : S410	QTY	COST	TOTALS	QTY	COST
SYSTEM DATA																									
ROUTE LENGTH	RF	3950		0	1065	0	2405	0	2148	0	0	0	0	0	0	0	0	0	0	0	9568	0			
TRACK LENGTH	TF	8700		0	2130	0	8550	0	4296	0	12060	0	0	0	0	0	0	0	0	0	35736	0			
CONSTRUCTION COSTS																									
SITE MODIFICATIONS:																									
-DEMOLITION	RF	3950		0	395	0	1	0	7762	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950		8619	1065	144	2405	1854	2148	496	1	47	500	0	0	0	0	0	0	0	3952	8657	0	0	
-STREET AND ROAD MODIFICATIONS	RF	3950		494	0	2405	2405	241	0	0	0	0	0	0	0	0	0	0	0	0	9569	11160	0	0	
-RAILROAD MODIFICATIONS	LS	1		1000	0	0	0	0	0	0	1	500	0	0	0	0	0	0	0	0	6355	735	0	0	
-STRUCTURE MODIFICATIONS	LS	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1500	0	0	
-UNDERPINNING	LS	0		0	0	0	1	0	1	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-ENVIRONMENTAL MITIGATIONS	LS	1		500	0	0	1	2790	0	0	0	0	0	0	0	0	0	0	0	0	2	1000	0	0	
TRACKWAY - AERIAL	RF	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3290	0	0	
TRACKWAY - AT GRADE	RF	1640		164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1640	164	0	0	
TRACKWAY - RETAINED CUT	RF	920		7416	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	920	7416	0	0	
SUBWAY:																									
-CUT AND COVER (SEPT WALLS) , 2-TRACK RF	RF	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-CUT AND COVER (SEPT WALLS) , 4-TRACK RF	RF	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390		28894	0	0	870	16151	2148	56829	0	0	0	0	0	0	0	0	0	0	1390	28894	0	0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0		0	0	0	350	9260	2148	0	0	0	0	0	0	0	0	0	0	0	870	16151	0	0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	0		0	1065	28176	0	28176	0	0	0	0	0	0	0	0	0	0	0	0	3563	94265	0	0	
STATION - STRUCT/FINISH, APPROX. 1,100' EA	TF	3280		433	0	0	1	82382	0	0	12060	1869	0	0	0	0	0	0	0	0	1	82382	0	0	
TRACKWORK - BALLASTED	TF	5420		1247	2130	490	8550	1967	4296	988	0	0	0	0	0	0	0	0	0	0	15340	2302	0	0	
TRACKWORK - DIRECT FIXATION	LS	1		350	0	0	1	410	0	0	1	595	0	0	0	0	0	0	0	0	20396	4692	0	0	
SPECIAL TRACKWORK, TURNS, ETC.	EA	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1355	0	0	
TRACTION POWER SYSTEM (SYS WIDE)	LS	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SIGNALING - WAYSIDE AND STATION	TF	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	
COMMUNICATIONS (SYSTEM WIDE)	EA	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	
YARDS & SHOPS (SYSTEM WIDE)	EA	0		0	0	0	0	0	0	0	1	3702	0	0	0	0	0	0	0	0	1	3702	0	0	
ROLLING STOCK (SYSTEM WIDE)	EA	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	45000	0	0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)EA	EA	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	2875	0	0	
DIESEL LOCOMOTIVE SALVAGE	EA	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Subtotal CONSTRUCTION COSTS :																									
\$49512																									
\$28810																									
\$122817																									
\$59313																									
\$7213																									
\$55015																									
\$0																									
NON-CONSTRUCTION COSTS																									
RIGHT OF WAY & RELOCATION	EA	1		1751	0	0	1	4500	1	80	1	1000	0	0	0	0	0	0	0	0	4	7331	0	0	
ENGINEERING & MANAGEMENT	0	12553		0	10302	0	32173	0	21087	0	1903	0	288	0	0	0	0	0	0	0	0	82160	0	0	
Subtotal NON-CONSTRUCTION COSTS :																									
\$14304																									
\$10302																									
\$36673																									
\$2903																									
\$3854																									
\$0																									
CONTINGENCY																									
CONTINGENCY	0	14048		0	7812	0	42978	0	16200	0	2370	0	776	0	7775	0	0	0	0	0	0	91959	0	0	
ESCALATION																									
ESCALATION (NOT BILLIED)	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PROJECT RESERVE																									
PROJECT RESERVE	0	6229		0	3754	0	16197	0	7734	0	999	0	315	0	3082	0	0	0	0	0	0	38310	0	0	
TOTAL :																									
\$94093																									
\$50678																									
\$218665																									
\$104414																									
\$13485																									
\$4254																									
\$69726																									
\$0																									
\$545315																									

SEGMENT: 1A - 7TH & 16TH TO 3RD & TOWNSEND S

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	3950.0		1.00	
TRACK LENGTH	TF	8700.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3950.0	100	1.00	395
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950.0	2182	1.00	8619
-STREET AND ROAD MODIFICATIONS	RF	3950.0	125	1.00	494
-RAILROAD MODIFICATIONS	LS	1.0	1000000	1.00	1000
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	500000	1.00	500
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	1640.0	100	1.00	164
TRACKWAY - RETAINED CUT	RF	920.0	9483	0.85	7416
SUBWAY:					
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390.0	19071	1.09	28894
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF	3280.0	132	1.00	433
TRACKWORK - DIRECT FIXATION	TF	5420.0	230	1.00	1247
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350000	1.00	350
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$49512
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1750740	1.00	1751
ENGINEERING & MANAGEMENT				1.00	12553
Subtotal NON-CONSTRUCTION COSTS :					\$14304
CONTINGENCY					
CONTINGENCY				1.00	14048
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	6229
TOTAL :					\$84093

SEGMENT: 1B - 7TH & 16TH TO 3RD & TOWNSEND D

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	4780.0		1.00	
TRACK LENGTH	TF	10360.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	4780.0	100	1.00	478
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4780.0	2742	1.00	13107
-STREET AND ROAD MODIFICATIONS	RF	4780.0	300	0.80	1147
-RAILROAD MODIFICATIONS	LS	1.0	1000000	1.00	1000
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	500000	1.00	500
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	150.0	100	1.00	15
TRACKWAY - RETAINED CUT	RF	680.0	9483	0.85	5481
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3950.0	19071	1.09	82110
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF	300.0	132	1.00	40
TRACKWORK - DIRECT FIXATION	TF	10060.0	230	1.00	2314
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350000	1.00	350
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$106542
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1850740	1.00	1851
ENGINEERING & MANAGEMENT				1.00	26821
Subtotal NON-CONSTRUCTION COSTS :					\$28672
CONTINGENCY					
CONTINGENCY				1.00	28880
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	13128
TOTAL :					\$177222

SEGMENT: 2 - MINED TUNNEL, 3RD ST TO FOLSOM

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	2720.0		1.00	
TRACK LENGTH	TF	5440.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	2720.0	100	1.00	272
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2720.0	182	1.00	495
-STREET AND ROAD MODIFICATIONS	RF	2720.0	33	1.00	90
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0	1500000	1.00	1500
-ENVIRONMENTAL MITIGATIONS	LS	1.0		1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.15	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.15	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.15	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	550.0	17189	1.08	10210
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	2170.0	25686	1.03	57411
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	5440.0	230	1.00	1251
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$71229
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3823050	1.00	3823
ENGINEERING & MANAGEMENT				1.00	24505
Subtotal NON-CONSTRUCTION COSTS :					\$28328
CONTINGENCY					
CONTINGENCY				1.00	20312
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	9590
TOTAL :					\$129459

SEGMENT: 3AC - MARKET/BEALE VIA C & C

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	3559.0		1.00	
TRACK LENGTH	TF	15836.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3559.0	100	2.00	712
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3559.0	4046	1.00	14400
-STREET AND ROAD MODIFICATIONS	RF	3559.0	300	2.00	2135
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS	1.0	5000000	1.00	5000
-UNDERPINNING	LS	1.0	3000000	1.00	3000
-ENVIRONMENTAL MITIGATIONS	LS	1.0	1500000	1.00	1500
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF	1120.0	52505	1.27	74683
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1234.0	17189	1.58	33514
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	125.0	120290	1.03	15487
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	115280198	1.00	115280
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	15836.0	230	1.00	3642
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	850000	1.00	850
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$270203
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	7301538	1.00	7302
ENGINEERING & MANAGEMENT				1.00	69985
Subtotal NON-CONSTRUCTION COSTS :					\$77287
CONTINGENCY					
CONTINGENCY				1.00	72565
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	33604
TOTAL :					\$453659

SEGMENT: 3AM - MARKET/BEALE VIA MINED TUNNEL

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	3030.0		1.00	
TRACK LENGTH	TF	13560.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3030.0	100	2.00	606
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3030.0	4518	1.00	13690
-STREET AND ROAD MODIFICATIONS	RF	3030.0	300	2.00	1818
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS	1.0	5000000	1.00	5000
-UNDERPINNING	LS	1.0	2000000	1.00	2000
-ENVIRONMENTAL MITIGATIONS	LS	1.0	1500000	1.00	1500
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.15	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF	1120.0	52505	1.17	68803
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	150.0	17189	1.83	4718
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	680.0	51372	1.03	35981
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	117070124	1.00	117070
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	13560.0	230	1.00	3119
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	850000	1.00	850
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$255155
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	10535333	1.00	10535
ENGINEERING & MANAGEMENT				1.00	68800
Subtotal NON-CONSTRUCTION COSTS :					\$79335
CONTINGENCY					
CONTINGENCY				1.00	69898
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	32351
TOTAL :					\$436739

SEGMENT: 3BC - MARKET/BEALE STAGGERED C&C

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	3515.0		1.00	
TRACK LENGTH	TF	10230.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3515.0	100	2.00	703
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3515.0	3760	1.00	13216
-STREET AND ROAD MODIFICATIONS	RF	3515.0	570	1.00	2004
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS	1.0	5500000	1.00	5500
-UNDERPINNING	LS	1.0	2500000	1.00	2500
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2400000	1.00	2400
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			0.90	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			0.95	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1150.0	19071	1.28	28073
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1215.0	17189	1.08	22555
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	99266160	1.00	99266
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	10230.0	230	1.00	2353
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	435000	1.00	435
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$179005
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	7301538	1.00	7302
ENGINEERING & MANAGEMENT				1.00	45481
Subtotal NON-CONSTRUCTION COSTS :					\$52783
CONTINGENCY					
CONTINGENCY				1.00	49388
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	22494
TOTAL :					\$303670

SEGMENT: 3BM - MARKET/BEALE STAGGERED MINED

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	3030.0		1.00	
TRACK LENGTH	TF	10060.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3030.0	100	2.00	606
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3030.0	4127	1.00	12505
-STREET AND ROAD MODIFICATIONS	RF	3030.0	472	1.00	1430
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS	1.0	5500000	1.00	5500
-UNDERPINNING	LS	1.0	2000000	1.00	2000
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2400000	1.00	2400
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			0.90	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			0.95	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1150.0	19071	1.28	28073
-CUT AND COVER (MESH/ROCK BOLTS)	RF	150.0	17189	1.08	2785
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	680.0	25686	1.03	17990
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	99266160	1.00	99266
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	10060.0	230	1.00	2314
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	435000	1.00	435
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$175304
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	10535333	1.00	10535
ENGINEERING & MANAGEMENT				1.00	46858
Subtotal NON-CONSTRUCTION COSTS :					\$57393
CONTINGENCY					
CONTINGENCY				1.00	49478
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	22574
TOTAL :					\$304749

SEGMENT: 3CC - MISSION/FOLSOM C & C

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	2945.0		1.00	
TRACK LENGTH	TF	9790.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	2945.0	100	2.00	589
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2945.0	3627	1.00	10682
-STREET AND ROAD MODIFICATIONS	RF	2945.0	470	1.00	1384
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS	1.0	500000	1.00	500
-UNDERPINNING	LS	1.0	2500000	1.00	2500
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2400000	1.00	2400
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.15	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			0.95	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	510.0	19071	1.28	12450
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1315.0	17189	1.08	24412
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	95197273	1.00	95197
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	9790.0	230	1.00	2252
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	435000	1.00	435
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$152801
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	301538	1.00	302
ENGINEERING & MANAGEMENT				1.00	38230
Subtotal NON-CONSTRUCTION COSTS :					\$38532
CONTINGENCY					
CONTINGENCY				1.00	40052
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	18511
TOTAL :					\$249896

SEGMENT: 3CM - MISSION/FOLSOM MINED

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	2420.0		1.00	
TRACK LENGTH	TF	8820.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	2420.0	100	2.00	484
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2420.0	4119	1.00	9968
-STREET AND ROAD MODIFICATIONS	RF	2420.0	387	1.00	937
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS	1.0	500000	1.00	500
-UNDERPINNING	LS	1.0	2000000	1.00	2000
-ENVIRONMENTAL MITTIGATIONS	LS	1.0	2400000	1.00	2400
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.15	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			0.95	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	570.0	19071	1.28	13914
-CUT AND COVER (MESH/ROCK BOLTS)	RF	150.0	17189	1.08	2785
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	680.0	25686	1.03	17990
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	95197273	1.00	95197
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	8820.0	230	1.00	2029
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	435000	1.00	435
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$148639
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3535333	1.00	3535
ENGINEERING & MANAGEMENT				1.00	39492
Subtotal NON-CONSTRUCTION COSTS :					\$43027
CONTINGENCY					
CONTINGENCY				1.00	40060
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	18538
TOTAL :					\$250264

SEGMENT: 4 - 3RD & TOWNSEND TO DELANCEY ST.

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	1830.0		1.00	
TRACK LENGTH	TF	4460.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1830.0	100	1.50	275
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1830.0	1596	1.00	2921
-STREET AND ROAD MODIFICATIONS	RF	1830.0	336	1.00	615
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	150000	1.00	150
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.15	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.15	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	580.0	19071	1.11	12278
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1250.0	17189	1.11	23850
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	4460.0	230	1.00	1026
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$41115
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	447000	1.00	447
ENGINEERING & MANAGEMENT				1.00	10323
Subtotal NON-CONSTRUCTION COSTS :					\$10770
CONTINGENCY					
CONTINGENCY				1.00	10826
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	5017
TOTAL :					\$67728

SEGMENT: 5 - DELANCEY ST. TO FOLSOM ST.

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	1301.0		1.00	
TRACK LENGTH	TF	2602.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1301.0	100	1.00	130
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1301.0	469	1.00	610
-STREET AND ROAD MODIFICATIONS	RF	1301.0	298	1.00	388
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1301.0	19071	1.11	27541
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	2602.0	230	1.00	598
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$29267
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	2666287	1.00	2666
ENGINEERING & MANAGEMENT				1.00	7583
Subtotal NON-CONSTRUCTION COSTS :					\$10249
CONTINGENCY					
CONTINGENCY				1.00	8171
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	3815
TOTAL :					\$51502

SEGMENT: 6A - 7TH & 16TH TO 2ND & KING SHORT

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	5245.0		1.00	
TRACK LENGTH	TF	11290.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	5245.0	100	1.00	525
-UTILITY RELOCATIONS/MODIFICATIONS	RF	5245.0	2113	1.00	11083
-STREET AND ROAD MODIFICATIONS	RF	5245.0	300	2.00	3147
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	540000	1.00	540
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	980.0	100	1.00	98
TRACKWAY - RETAINED CUT	RF	1165.0	9483	0.97	10716
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3100.0	19071	0.96	56755
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF	1960.0	132	1.00	259
TRACKWORK - DIRECT FIXATION	TF	9330.0	230	1.00	2146
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350000	1.00	350
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$86119
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	21530
Subtotal NON-CONSTRUCTION COSTS :					\$21530
CONTINGENCY					
CONTINGENCY				1.00	23389
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	10483
TOTAL :					\$141521

SEGMENT: 6AX - 6A SEGMENT CUT BACK TO 3RD ST

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	4445.0		1.00	
TRACK LENGTH	TF	9690.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	4445.0	100	1.00	445
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4445.0	2113	1.00	9392
-STREET AND ROAD MODIFICATIONS	RF	4445.0	300	2.00	2667
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	540000	1.00	540
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	980.0	100	1.00	98
TRACKWAY - RETAINED CUT	RF	1165.0	9483	0.97	10716
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	2300.0	19071	0.96	42109
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF	1960.0	132	1.00	259
TRACKWORK - DIRECT FIXATION	TF	7730.0	230	1.00	1778
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350000	1.00	350
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$68854
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	17214
Subtotal NON-CONSTRUCTION COSTS :					\$17214
CONTINGENCY					
CONTINGENCY				1.00	18810
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	8390
TOTAL :					\$113268

SEGMENT: 6B - 7TH & 16TH TO 2ND & KING DEEP

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	5330.0		1.00	
TRACK LENGTH	TF	11460.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	5330.0	100	1.00	533
-UTILITY RELOCATIONS/MODIFICATIONS	RF	5330.0	2689	1.00	14332
-STREET AND ROAD MODIFICATIONS	RF	5330.0	300	2.00	3198
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	540000	1.00	540
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	150.0	100	1.00	15
TRACKWAY - RETAINED CUT	RF	680.0	9483	1.00	6448
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.15	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.15	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	4500.0	19071	1.03	88394
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.15	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF	300.0	132	1.00	40
TRACKWORK - DIRECT FIXATION	TF	10860.0	230	1.00	2498
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350000	1.00	350
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$116848
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	29212
Subtotal NON-CONSTRUCTION COSTS :					\$29212
CONTINGENCY					
CONTINGENCY				1.00	31393
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	14196
TOTAL :					\$191649

SEGMENT: 6BX - 6B SEGMENT CUT BACK TO 3RD ST

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	4530.0		1.00	
TRACK LENGTH	TF	10660.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	4530.0	100	1.00	453
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4530.0	2689	1.00	12181
-STREET AND ROAD MODIFICATIONS	RF	4530.0	300	2.00	2718
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	540000	1.00	540
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	150.0	100	1.00	15
TRACKWAY - RETAINED CUT	RF	680.0	9483	1.00	6448
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.15	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.15	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3700.0	19071	1.03	72680
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.15	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF	300.0	132	1.00	40
TRACKWORK - DIRECT FIXATION	TF	9260.0	230	1.00	2130
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350000	1.00	350
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$98055
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	24514
Subtotal NON-CONSTRUCTION COSTS :					\$24514
CONTINGENCY					
CONTINGENCY				1.00	26386
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	11916
TOTAL :					\$160871

SEGMENT: 7 - 2ND & KING TO BRANNAN & COLIN

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	1885.0		1.00	
TRACK LENGTH	TF	3770.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1885.0	100	1.00	189
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1885.0	225	1.00	424
-STREET AND ROAD MODIFICATIONS	RF	1885.0	32	1.00	60
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0	300000	1.00	300
-ENVIRONMENTAL MITIGATIONS	LS	1.0	130000	1.00	130
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.15	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.15	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.15	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1550.0	17189	1.18	31439
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	335.0	25686	1.03	8863
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	3770.0	230	1.05	910
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$42315
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	289005	1.00	289
ENGINEERING & MANAGEMENT				1.00	11583
Subtotal NON-CONSTRUCTION COSTS :					\$11872
CONTINGENCY					
CONTINGENCY				1.00	10935
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	5210
TOTAL :					\$70332

SEGMENT: 8 - BRANNAN & COLIN P. TO FOLSOM

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	1065.0		1.00	
TRACK LENGTH	TF	2130.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1065.0	135	1.00	144
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	1065.0	25686	1.03	28176
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	2130.0	230	1.00	490
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$28810
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	10302
Subtotal NON-CONSTRUCTION COSTS :					\$10302
CONTINGENCY					
CONTINGENCY				1.00	7812
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	3754
TOTAL :					\$50678

SEGMENT: 9A - NEW - ABOVE GROUND TRANSBAY T.

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	2405.0		1.00	
TRACK LENGTH	TF	8550.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	7762334	1.00	7762
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2405.0	207	1.00	498
-STREET AND ROAD MODIFICATIONS	RF	2405.0	100	1.00	241
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2000000	1.00	2000
TRACKWAY - AERIAL	RF	670.0	8000	0.90	4824
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF	300.0	9483	1.00	2845
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	250.0	17189	1.08	4641
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	60774903	1.00	60775
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	8550.0	230	1.00	1967
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	410000	1.00	410
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$85963
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	4500000	1.00	4500
ENGINEERING & MANAGEMENT				1.00	21941
Subtotal NON-CONSTRUCTION COSTS :					\$26441
CONTINGENCY					
CONTINGENCY				1.00	30538
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	11435
TOTAL :					\$154377

SEGMENT: 9B - NEW - C&C TRANSBAY TERMINAL

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	2405.0		1.00	
TRACK LENGTH	TF	8550.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	7762334	1.00	7762
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2405.0	771	1.00	1854
-STREET AND ROAD MODIFICATIONS	RF	2405.0	100	1.00	241
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0		1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2790000	1.00	2790
TRACKWAY - AERIAL	RF			0.90	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	870.0	17189	1.08	16151
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	350.0	25686	1.03	9260
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	82382114	1.00	82382
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	8550.0	230	1.00	1967
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	410000	1.00	410
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$122817
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	4500000	1.00	4500
ENGINEERING & MANAGEMENT				1.00	32173
Subtotal NON-CONSTRUCTION COSTS :					\$36673
CONTINGENCY					
CONTINGENCY				1.00	42978
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	16197
TOTAL :					\$218665

SEGMENT: 10 - 3RD AND TOWNSEND TO BRANNAN

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	2380.0		1.00	
TRACK LENGTH	TF	4760.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	2380.0	100	1.00	238
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2380.0	1171	1.00	2787
-STREET AND ROAD MODIFICATIONS	RF	2380.0	300	1.00	714
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0	1000000	1.00	1000
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	2045.0	17189	1.13	39721
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	335.0	25686	1.03	8863
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	4760.0	230	1.00	1095
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$54418
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1991227	1.00	1991
ENGINEERING & MANAGEMENT				1.00	14779
Subtotal NON-CONSTRUCTION COSTS :					\$16770
CONTINGENCY					
CONTINGENCY				1.00	14852
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	6883
TOTAL :					\$92923

SEGMENT: 11 - MINED TUNNEL -3RD TO C.P.KELLY

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	2148.0		1.00	
TRACK LENGTH	TF	4296.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2148.0	231	1.00	496
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0	1000000	1.00	1000
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	2148.0	25686	1.03	56829
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	4296.0	230	1.00	988
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$59313
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	80000	1.00	80
ENGINEERING & MANAGEMENT				1.00	21087
Subtotal NON-CONSTRUCTION COSTS :					\$21167
CONTINGENCY					
CONTINGENCY				1.00	16200
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	7734
TOTAL :					\$104414

SEGMENT: 12 - CUT & COVER, EMBARCADERO

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF	988.0		1.00	
TRACK LENGTH	TF	1976.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	988.0	100	1.50	148
-UTILITY RELOCATIONS/MODIFICATIONS	RF	988.0	469	1.00	463
-STREET AND ROAD MODIFICATIONS	RF	988.0	300	1.50	445
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:					
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	988.0	19071	1.18	22234
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	1976.0	230	1.00	454
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
ROLLING STOCK (SYSTEM WIDE)	EA				
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA				
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$23744
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	5936
Subtotal NON-CONSTRUCTION COSTS :					\$5936
CONTINGENCY					
CONTINGENCY				1.00	6078
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	2861
TOTAL :					\$38619

SEGMENT: SW1 - TRACTION POWER, DWTN SF GILROY

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	55479524	1.00	55480
SIGNALING - WAYSIDE AND STATION	LS	1.0	20100000	1.00	20100
COMMUNICATIONS (SYSTEM WIDE)	TF	1.0	300000	1.00	300
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	500000	1.00	500
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$76380
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	19095
Subtotal NON-CONSTRUCTION COSTS :					\$19095
CONTINGENCY					
CONTINGENCY				1.00	22914
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	9471
TOTAL :					\$127860

SEGMENT: SW2 - TRACTION POWER, IRWIN TO DWTN

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	2919000	1.00	2919
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	500000	1.00	500
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$3419
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	855
Subtotal NON-CONSTRUCTION COSTS :					\$855
CONTINGENCY					
CONTINGENCY				1.00	1026
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	424
TOTAL :					\$5724

SEGMENT: SW3 - SATELLITE YARD (16TH /I-280)

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGH	RF			1.00	
TRACK LENGH	TF	12060.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	500000	1.00	500
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	47250	1.00	47
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS) , 2-TRACK	RF			1.00	
-CUT AND COVER (SPIC WALLS) , 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF	12060.0	155	1.00	1869
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	595000	1.00	595
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	3702279	1.00	3702
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$7213
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1000000	1.00	1000
ENGINEERING & MANAGEMENT				1.00	1903
Subtotal NON-CONSTRUCTION COSTS :					\$2903
CONTINGENCY					
CONTINGENCY				1.00	2370
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	999
TOTAL :					\$13485

SEGMENT: SW4 - SATELLITE YARD (BAYSHORE)

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF	12010.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS	1.0	200000	1.00	200
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF	12010.0	155	1.00	1862
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	720000	1.00	720
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	2891030	1.00	2891
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$5673
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	1418
Subtotal NON-CONSTRUCTION COSTS :					\$1418
CONTINGENCY					
CONTINGENCY				1.00	1510
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	688
TOTAL :					\$9289

SEGMENT: SW5 - LNG FUELING FACILITIES

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	2000000	1.00	2000
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$2000
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	500
Subtotal NON-CONSTRUCTION COSTS :					\$500
CONTINGENCY					
CONTINGENCY				1.00	600
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	248
TOTAL :					\$3348

SEGMENT: SW6 - NEW ELECTRIC LOCO'S, VENT CRED

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF	1.0	-6400000	1.00	-6400
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	-6700000	1.00	-6700
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA	23.0	4700000	1.00	108100
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA	23.0	-1000000	1.00	-23000
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$72000
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	-32
Subtotal NON-CONSTRUCTION COSTS :					\$-32
CONTINGENCY					
CONTINGENCY				1.00	8184
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	2847
TOTAL :					\$82999

SEGMENT: SW6X - NEW ELECTRIC LOCO'S (BARE)

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF			1.00	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA	23.0	4700000	1.00	108100
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA	23.0	-1000000	1.00	-23000
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$85100
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	3243
Subtotal NON-CONSTRUCTION COSTS :					\$3243
CONTINGENCY					
CONTINGENCY				1.00	11459
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	4419
TOTAL :					\$104221

SEGMENT: SW7 - DUAL-MODE LOCO'S, VENT CREDIT

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF	1.0	-6400000	1.00	-6400
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	-6700000	1.00	-6700
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA	23.0	7000000	1.00	161000
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA	23.0	-1000000	1.00	-23000
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$124900
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	1555
Subtotal NON-CONSTRUCTION COSTS :					\$1555
CONTINGENCY					
CONTINGENCY				1.00	13791
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	5010
TOTAL :					\$145256

SEGMENT: SW7X - DUAL-MODE LOCO'S, BARE

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGH	RF			1.00	
TRACK LENGH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-SIRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF			1.00	
-CUT AND COVER (SEPTIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SEPTIC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA	23.0	7000000	1.00	161000
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA	23.0	-1000000	1.00	-23000
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$138000
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	4830
Subtotal NON-CONSTRUCTION COSTS :					\$4830
CONTINGENCY					
CONTINGENCY				1.00	17066
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	6582
TOTAL :					\$166478

SEGMENT: SW8 - LOCO UPGRADE TO LNG, VENT CRED

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGH	RF			1.00	
TRACK LENGH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF	1.0	-6000000	1.00	-6000
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	-800000	1.00	-800
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA	23.0	280000	1.00	6440
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$-360
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	-1056
Subtotal NON-CONSTRUCTION COSTS :					\$-1056
CONTINGENCY					
CONTINGENCY				1.00	39
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	-110
TOTAL :					\$-1487

SEGMENT: SW8X - EXIST LOCO UPGRADE TO LNG BARE

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF			1.00	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA	23.0	280000	1.00	6440
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$6440
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	644
Subtotal NON-CONSTRUCTION COSTS :					\$644
CONTINGENCY					
CONTINGENCY				1.00	1739
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	706
TOTAL :					\$9529

SEGMENT: SW9 - CLEAN DIESEL LOCO. UPGRADE

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA			1.00	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA	23.0	125000	1.00	2875
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$2875
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	288
Subtotal NON-CONSTRUCTION COSTS :					\$288
CONTINGENCY					
CONTINGENCY				1.00	776
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	315
TOTAL :					\$4254

SEGMENT: SW10 - MISC. SYSTEM WIDE ELEMENTS

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL (\$000)
SYSTEM DATA					
ROUTE LENGH	RF			1.00	
TRACK LENGH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-SIRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			1.00	
STATION - STRUCT/FINISH, APPROX. 1,100'	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS	1.0	3376000	1.00	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	1.0	6639000	1.00	6639
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
ROLLING STOCK (SYSTEM WIDE)	EA	25.0	1800000	1.00	45000
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			1.00	
DIESEL LOCOMOTIVE SALVAGE	EA			1.00	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					\$55015
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	3854
Subtotal NON-CONSTRUCTION COSTS :					\$3854
CONTINGENCY					
CONTINGENCY				1.00	7775
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	3082
TOTAL :					\$69726

SEGMENTS 9A & 9B

--WORK BREAKDOWN-- FACIL-STANDRD.WKPKG =====									
DESCRIPTION		QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	TOTAL DOLLARS
=====									
115	DEMOLITION - TRANSBAY TERMINAL								
115	TRAFFIC CONTROL	1 LS	5000		0	0	0	0	262500
115	CONCRETE DEMOLITION	15700 CY	22451		0	0	0	0	1252860
115	HAUL CONCRETE TO GRINDING & RECYCLING PLANT	15700 CY	0		0	0	0	0	214305
115	STRUCT STEEL DISMANTLING	3600 TN	13500		0	0	0	0	888300
115	HAUL STEEL TO SALVAGE YARD	3600 TN	0		0	0	0	0	15120
115	STEEL SALVAGE VALUE	3600 TN	0		0	0	0	0	-113400
115	ROOFING & SIDING DEMOLITION	233700 SF	4674		0	0	0	0	230662
115	HAUL ROOFING & SIDING TO COLMA DUMP (INCL FEE)	26000 CY	0		0	0	0	0	819000
115	REMOVE & HAUL OFF INTERIOR WALLS & PARTITIONS	1 LS	3500		0	0	0	0	525000
115	REMOVE & HAUL OFF PIPING & ELECTRICS	1 LS	2000		0	0	0	0	299250
TOTAL DEMOLITION - TRANSBAY TERMINAL		51,125		0	0	0	4,184,378	0	4,393,597
=====									
REPORT TOTAL		51,125		0	0	0	4,184,378	0	4,393,597

JOB NO. 65928-005
TITLE UNTITLED
DRG. COLORID -R FULL SIZE

SUBJECT CALTRAIN DTX
16 TH ST YARD
SEGMENT SW3

CHECKED BY _____

DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT OR WEIGHT	QUANTITY	TOTAL QUANTITY
DEMOLITION						
DEMOLISH LARGE BUILDING North of 16 TH ST						
		1300	180*		234000 SF	
*NOTE WIDTH NOT CLEAN ON THE DATA WILL						
SAT \$2/SF						\$468000
					USE	500000

SEGMENT 1A: 7th St., Townsend St.

7th to 6th: surface
6th thru 5th: U-wall
5th to 3rd: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	15" VCP	leave in place	7th to 4th	2300	0	0	7,458,500
	2.	3' X 5' brick	leave in place	4th to 3rd	900	0	0	
	3.	10" force main	relocate	7th to 5th	1500	70	105,000	
	4.	4 - 9.5' X 8.3' RC boxes	leave in place	xing @ 7th/Berry	80	0	0	
	5.	10' X 7' RC on piles*	replace in 6th	xing @ 6th	700	4000	2,800,000	
	6.	6' RC on piles*	consolidate w/ 10' X 7'	xing @ 6th	700	0	0	
	7.	9' X 7' RC on piles*	reroute to 6th	xing @ 5th	1000	2500	2,500,000	
	8.	18" pipe	abandon	xing @ 5th	500	0	0	
	9.	6.5' brick/concrete*	reroute to 5th	xing @ 4th	1000	2000	2,000,000	
	10.	30" force main	raise/support in place	xing @ 4th	80	170	13,600	
	11.	21" pipe*	empty into 6.5'	xing @ 4th	20	120	2,400	
	12.	Service laterals	support in place	3 between 7th/3rd	150	50	7,500	
	13.	Storm drain inlets	replace	7th to 3rd	12	2500	30,000	
Sewer Subtotal								7,458,500
*Consolidate 6th, 5th, and 4th St. sewers in new sewer routed down Townsend and 6th to Berry								
Potable Water	1.	8" pipe	leave in place	7th to 3rd	3200	0	0	54,600
	2.	12" pipe	support in place	xing @ 4th	40	90	3,600	
	3.	8" pipe	reroute around U-wall	xing @ 5th	600	75	45,000	
	4.	Service laterals	support in place	3 between 7th/3rd	150	40	6,000	
Potable Water Subtotal								54,600
Auxiliary Water	1.	12" pipe	reinforce in place	xing @ 6th	50	105	5,250	72,450
	2.	12" pipe	reroute around U-wall	xing @ 5th	600	105	63,000	
	3.	12" pipe	support in place	xing @ 4th	40	105	4,200	
Auxiliary Water Subtotal								72,450
Gas	1.	16" CI pipe	relocate - north	4th to 3rd	900	125	112,500	117,700
	2.	3" PL pipe	support in place	xing @ 4th	40	50	2,000	
	3.	1" PL pipe - laterals	support in place	2 between 5th/4th	80	40	3,200	
Gas Subtotal								117,700
Electrical	1.	Medium RC box	replace		1	100000	100,000	849,300
	2.	Large RC box	replace		1	500000	500,000	
	3.	Active conduit (3"Ø)	relocate	7th to 3rd	1145	20	22,900	
	4.	Trench, joint (18"X40")	relocate	7th to 3rd	1145	40	45,800	
	5.	Overhead power poles	relocate	7th to 3rd	9	15000	135,000	
	6.	Streetlights/signals	replace	7th to 3rd	12	3800	45,600	
Electrical Subtotal								849,300
Communications	1.	Small RC box (PacBell)	replace		4	5000	20,000	58,000
	2.	Conduit (2"Ø) (PacBell)	relocate	5th to 3rd	3800	10	38,000	
Communications Subtotal								58,000
Segment 1A Total								8,610,550

C = 3950 RF
8,610,550 / 3950
= 2180 / RF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 1B

Prepared by AGS, Inc.
10/3/95

SEGMENT 1B: 7th St., Townsend St.

7th - to Irwin: surface
7th - Irwin to Berry: U-wall
Berry to 3rd: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	15" VCP	leave in place	7th to 4th	2300	0	0	11,969,100
	2.	3' X 5' brick	leave in place	4th to 3rd	900	0	0	
	3.	10" force main	relocate	7th to 5th	1500	70	105,000	
	4.	4 - 9.5' X 8.3' RC boxes	lower	xing @ 7th/Berry	1	3000000	3,000,000	
	5.	10' X 7' RC on piles*	reroute to 7th/Berry	xing @ 6th	2000	3000	6,000,000	
	6.	6' RC on piles*	consolidate w/ 10' X 7'	xing @ 6th	2000	0	0	
	7.	9' X 7' RC on piles*	reroute to 6th	xing @ 5th	1000	2500	2,500,000	
	8.	18" pipe	abandon	xing @ 5th	500	0	0	
	9.	6.5' brick/concrete	support in place	xing @ 4th	1	300000	300,000	
	10.	30" force main	support in place	xing @ 4th	40	170	6,800	
	11.	21" pipe	support in place	xing @ 4th	40	120	4,800	
	12.	Service laterals	support in place	3 between 7th/3rd	150	50	7,500	
	13.	Storm drain inlets	replace	7th to 3rd	18	2500	45,000	
*Consolidate 6th and 5th St. sewers in new sewer routed down Townsend and 7th to Berry								Sewer Subtotal
								11,969,100
Potable Water	1.	8" pipe	leave in place	7th to 3rd	3200	0	0	42,600
	2.	18" stl. pipe	reroute around U-wall	xing @ Berry	200	150	30,000	
	3.	12" pipe	support in place	xing @ 4th	40	90	3,600	
	4.	8" pipe	support in place	xing @ 5th	40	75	3,000	
	5.	Service laterals	support in place	3 between 7th/3rd	150	40	6,000	
								Potable Water Subtotal
Auxiliary Water	1.	14" CI pipe	reroute around U-wall	xing @ Berry	200	140	28,000	40,600
	2.	12" CI pipe	support in place	3: xing @ 6th, 5th, 4th	120	105	12,600	
								Auxiliary Water Subtotal
Gas	1.	16" CI pipe	relocate - north	4th to 3rd	900	125	112,500	117,700
	2.	3" PL pipe	support in place	xing @ 4th	40	50	2,000	
	3.	1" PL pipe - laterals	support in place	2 between 5th/4th	80	40	3,200	
								Gas Subtotal
Electrical	1.	Medium RC box	replace	7th to 3rd	1	100000	100,000	879,700
	2.	Large RC box	replace	7th to 3rd	1	500000	500,000	
	3.	Active conduit (3"16")	relocate	7th to 3rd	1145	20	22,900	
	4.	Trench, joint (18"X40")	relocate	7th to 3rd	1145	40	45,800	
	5.	Overhead power poles	relocate	7th to 3rd	9	15000	135,000	
	6.	Streetlights/signals	replace	7th to 3rd	20	3800	76,000	
								Electrical Subtotal
Communications	1.	Small RC box (PacBell)	replace	5th to 3rd	4	5000	20,000	58,000
	2.	Conduit (2"1/4") (PacBell)	relocate	5th to 3rd	3800	10	38,000	
								Communications Subtotal

Segment 1B Total 13,107,700

\$13,107,700 / 4,780

= \$2,742 / LF

L = 4,780'

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 2

Prepared by: AGS, Inc
10/3/95

SEGMENT 2: Begin Townsend St., End Bryant St. (link segments 1 and 3) 3rd to Bryant: mined tunnel

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	relocate	2: xing @ 3rd	250	500	125,000	144,500
	2.	Transition structures	new	for 3'X5' brick (2)	4	3000	12,000	
	3.	Storm drain inlets	replace	@ 3rd	3	2500	7,500	
Sewer Subtotal								
Potable Water	1.	6"/8" pipe	support in place	2: xing @ 3rd	200	75	15,000	15,000
Potable Water Subtotal								
Auxiliary Water	1.	12" pipe	support in place	xing @ 3rd	150	105	15,750	19,000
	2.	8" lateral to hydrant	extend/support	xing @ 3rd	50	65	3,250	
Auxiliary Water Subtotal								
Gas	1.	4"/6" CI pipe	support in place	2: xing @ 3rd	200	90	18,000	23,500
	2.	10" CI pipe	extend/support	xing @ 3rd	50	110	5,500	
Gas Subtotal								
Electrical	1.	Medium RC box	replace		2	100000	200,000	257,200
	2.	Active conduit (3"/6")	relocate	3rd	1900	20	38,000	
	3.	Trench (18"X40")	relocate	3rd	100	40	4,000	
	4.	Streetlights/signals	replace	3rd	4	3800	15,200	
Electrical Subtotal								
Communications	1.	Small RC box (PacBell)	replace		1	5000	5,000	37,000
	2.	Medium RC box (PacBell)	replace		1	20000	20,000	
	3.	Conduit (2"/4") (PacBell)	relocate	3rd	800	10	8,000	
	4.	Trench (18"X40")	relocate	3rd	100	40	4,000	
Communications Subtotal								

Segment 2 Total 496,200

$$C = 2,720 \quad \$ 496,200 / 2720$$

$$= \$182 / LF$$

SEGMENT 3AC: Beale St. (from segment 5)

Bryant to Harrison: cut/cover
Harrison to Market: cut/cover, 3-level station

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	12"/18" ISP/VCP	relocate	Bryant to Market	3000	100	300,000	
	2.	10" force main	relocate	Bryant to Market	3000	70	210,000	
	3.	24" ISP	support in place	xing @ Bryant	80	130	10,400	
	4.	12" VCP	support in place	xing @ Harrison	80	75	6,000	
	5.	3' X 5' brick	replace/support	xing @ Folsom	100	500	50,000	
	6.	3' X 5' brick*	consolidate w/ 3.5'X5.3'	xing @ Howard	700	0	0	
	7.	3.5' X 5.3' concrete*	reroute down Howard	xing @ Mission	1300	1000	1,300,000	
	8.	Service laterals	replace	new	22	1000	22,000	
	9.	Transition structures	new	for 3'X5' brick	3	3000	9,000	
	10.	Storm drain inlets	replace	Bryant to Market	31	2500	77,500	
*Consolidate Mission and Howard St. sewers in new sewer routed down Fremont and Howard to Main.							Sewer Subtotal	1,984,900
Potable Water	1.	12" pipe	relocate	Bryant to Market	3000	90	270,000	
	2.	8"/12" pipe	support in place	5. xing between Bryant/Market	400	90	36,000	
	3.	20" pipe	support in place	xing @ Folsom	80	150	12,000	
	4.	Service laterals	replace		22	1000	22,000	
							Potable Water Subtotal	340,000
Auxiliary Water	1.	10"/16" CI pipe	relocate - west	Bryant to Market	3000	130	390,000	
	2.	12" CI pipe	support in place	3: xing @ Folsom, Howard, Mission	160	105	16,800	
	3.	8" lateral to hydrants	relocate	4 between Bryant/Mission	4	4400	17,600	
	4.	35" X 24" cistern	replace	Beale @ Howard	1	400000	400,000	
							Auxiliary Water Subtotal	824,400
Gas	1.	4" PL pipe	relocate	Bryant to Folsom	1200	50	60,000	
	2.	16" CI pipe	relocate - west	Folsom to Market	1800	125	225,000	
	3.	3" PL pipe	relocate	xing @ Howard	80	50	4,000	
	4.	8" CI pipe	relocate	xing @ Mission	80	100	8,000	
	5.	1" PL pipe - laterals	relocate	3 between Bryant/Howard	240	40	9,600	
							Gas Subtotal	306,600
Electrical	1.	Small RC box	replace		11	20000	220,000	
	2.	Medium RC box	replace		8	100000	800,000	
	3.	Large RC box	replace		17	500000	8,500,000	
	4.	Active conduit (3"/6")	relocate	Bryant to Market	22500	20	450,000	
	5.	Trench (18"X40")	relocate	Bryant to Market	3400	40	136,000	
	6.	Streetlights/signals	replace	Bryant to Market	40	3800	152,000	
							Electrical Subtotal	10,258,000
Communications	1.	Small RC box (PacBell)	replace		9	5000	45,000	
	2.	Medium RC box (PacBell)	replace		9	20000	180,000	
	3.	Large RC box (PacBell)	replace		1	100000	100,000	
	4.	Conduit (2"/4") (PacBell)	relocate	Harrison to Market	29100	10	291,000	
	5.	Trench (18"X40")	relocate	Harrison to Market	2500	40	100,000	
							Communications Subtotal	716,000
							Segment 3AC Total	14,429,900

14,429,900/3,559

RF = 3,559

= \$4,054 USE \$4046/RF

SEGMENT 3AM: Beale St. (from segment 2)

Bryant to Harrison: mined tunnel
Harrison to Market: cut/cover, 3-level station

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	12"/15" ISP/VCP	relocate	Harrison to Market	2300	90	207,000	
	2.	10" force main	relocate	Harrison to Market	2300	70	161,000	
	3.	12" VCP	support in place	xing @ Harrison	80	75	6,000	
	4.	3' X 5' brick	replace/support	xing @ Folsom	100	500	50,000	
	5.	3' X 5' brick*	consolidate w/ 3.5' X 5.3'	xing @ Howard	700	0	0	
	6.	3.5' X 5.3' concrete*	reroute down Howard	xing @ Mission	1300	1000	1,300,000	
	7.	Service laterals	replace		18	1000	18,000	
	8.	Transition structures	new	for 3' X 5' brick	3	3000	9,000	
	9.	Storm drain inlets	replace	Harrison to Market	26	2500	65,000	
*Consolidate Mission and Howard St. sewers in new sewer routed down Fremont and Howard to Main.								Sewer Subtotal
								1,816,000
Potable Water	1.	12" pipe	relocate	Harrison to Market	2300	90	207,000	
	2.	8"/12" pipe	support in place	4: xing between Harrison/Market	320	90	28,800	
	3.	20" pipe	support in place	xing @ Folsom	80	150	12,000	
	4.	Service laterals	replace		18	1000	18,000	
								Potable Water Subtotal
								265,800
Auxiliary Water	1.	10"/14" CI pipe	relocate - west	Harrison to Market	2300	140	322,000	
	2.	12" CI pipe	support in place	3: xing @ Folsom, Howard, Mission	160	105	18,800	
	3.	8" lateral to hydrants	relocate	2 between Howard/Mission	2	4400	8,800	
	4.	35' ϕ X 24' cistern	replace	Beale @ Howard	1	400000	400,000	
								Auxiliary Water Subtotal
								747,600
Gas	1.	4" PL pipe	relocate	Harrison to Folsom	500	50	25,000	
	2.	16" CI pipe	relocate - west	Folsom to Market	1800	125	225,000	
	3.	3" PL pipe	relocate	xing @ Howard	80	50	4,000	
	4.	8" CI pipe	relocate	xing @ Mission	80	100	8,000	
	5.	1" PL pipe - laterals	relocate	2 between Folsom/Howard	160	40	6,400	
								Gas Subtotal
								268,400
Electrical	1.	Small RC box	replace		9	20000	180,000	
	2.	Medium RC box	replace		6	100000	600,000	
	3.	Large RC box	replace		17	500000	8,500,000	
	4.	Active conduit (3"/6")	relocate	Harrison to Market	21600	20	432,000	
	5.	Trench (18" X 40")	relocate	Harrison to Market	2600	40	104,000	
	6.	Streetlights/signals	replace	Harrison to Market	34	3600	129,200	
								Electrical Subtotal
								9,945,200
Communications	1.	Small RC box (PacBell)	replace		9	55	495	
	2.	Medium RC box (PacBell)	replace		9	20000	180,000	
	3.	Large RC box (PacBell)	replace		1	100000	100,000	
	4.	Conduit (27/4") (PacBell)	relocate	Harrison to Market	29100	10	291,000	
	5.	Trench (18" X 40")	relocate	Harrison to Market	2500	40	100,000	
								Communications Subtotal
								671,495

RF = 3030

Segment 3AM Total 13,714,495

13,714,495 / 3030

= \$4,526/RF

USE \$4,578/RF

SEGMENT 3BC: Beale St. (from segment 5)

Bryant to Harrison: cut/cover
Harrison to Market: cut/cover, 2-level station

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	12"/16" ISP/VCP	relocate	Bryant to Market	3000	110	330,000	
	2.	10" force main	relocate	Bryant to Market	3000	70	210,000	
	3.	24" ISP	support in place	xing @ Bryant	80	130	10,400	
	4.	12" VCP	support in place	xing @ Harrison	80	75	6,000	
	5.	3' X 5' brick	replace/support	xing @ Folsom	100	500	50,000	
	6.	3' X 5' brick	replace/support	xing @ Howard	100	500	50,000	
	7.	3.5' X 5.3' concrete	support in place	xing @ Mission	80	800	64,000	
	8.	Service laterals	replace	for 3'X5' brick (2)	22	1000	22,000	
	9.	Transition structures	new	Bryant to Market	4	3000	12,000	
	10.	Storm drain inlets	replace	Bryant to Market	31	2500	77,500	
							Sewer Subtotal	831,900
Potable Water	1.	12" pipe	relocate	Bryant to Market	3000	90	270,000	
	2.	8"/12" pipe	support in place	5: xing between Bryant/Market	400	90	36,000	
	3.	20" pipe	support in place	xing @ Folsom	80	150	12,000	
	4.	Service laterals	replace		22	1000	22,000	
							Potable Water Subtotal	340,000
Auxiliary Water	1.	10"/16" CI pipe	relocate - west	Bryant to Market	3000	130	390,000	
	2.	12" CI pipe	support in place	3: xing @ Folsom, Howard, Mission	160	105	16,800	
	3.	8" lateral to hydrants	relocate	4 between Bryant/Mission	4	4400	17,600	
	4.	35' X 24' cistern	replace	Beale @ Howard	1	400000	400,000	
							Auxiliary Water Subtotal	824,400
Gas	1.	4" PL pipe	relocate	Bryant to Folsom	1200	50	60,000	
	2.	16" CI pipe	relocate - west	Folsom to Market	1800	130	234,000	
	3.	3" PL pipe	relocate	xing @ Howard	80	50	4,000	
	4.	8" CI pipe	relocate	xing @ Mission	80	100	8,000	
	5.	1" PL pipe - laterals	relocate	3 between Bryant/Howard	240	40	9,600	
							Gas Subtotal	315,600
Electrical	1.	Small RC box	replace		11	20000	220,000	
	2.	Medium RC box	replace		8	100000	800,000	
	3.	Large RC box	replace		17	500000	8,500,000	
	4.	Active conduit (3"/6")	relocate	Bryant to Market	22500	20	450,000	
	5.	Trench (18" X 40")	relocate	Bryant to Market	3400	40	136,000	
	6.	Streetlights/signals	replace	Bryant to Market	40	3800	152,000	
							Electrical Subtotal	10,258,000
Communications	1.	Small RC box (PacBell)	replace		9	5000	45,000	
	2.	Medium RC box (PacBell)	replace		9	20000	180,000	
	3.	Large RC box (PacBell)	replace		1	100000	100,000	
	4.	Conduit (2"/4") (PacBell)	relocate	Harrison to Market	29100	10	291,000	
	5.	Trench (18" X 40")	relocate	Harrison to Market	2500	40	100,000	
							Communications Subtotal	716,000
							Segment 3BC Total	13,285,900

\$13,285,900 / 3515
 \$3780/RF USE \$3760/RF

RF = 3515

SEGMENT 3BM: Beale St. (from segment 2)

Bryant to Harrison: mined tunnel
Harrison to Market: cut/cover, 2-level station

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	12"/15" ISP/VCP	relocate	Harrison to Market	2300		207,000	
	2.	10" force main	relocate	Harrison to Market	2300		161,000	
	3.	12" VCP	support in place	xing @ Harrison	80		75	6,000
	4.	3' X 5' brick	replace/support	xing @ Folsom	100		50,000	
	5.	3' X 5' brick	replace/support	xing @ Howard	100		50,000	
	6.	3.5' X 5.3' concrete	support in place	xing @ Mission	80		64,000	
	7.	Service laterals	replace		18		18,000	
	8.	Transition structures	new	for 3'X5' brick (2)	4		12,000	
	9.	Storm drain inlets	replace	Harrison to Market	26		2500	
Sewer Subtotal							633,000	
Potable Water	1.	12" pipe	relocate	Harrison to Market	2300		207,000	
	2.	8"/12" pipe	support in place	4: xing between Harrison/Market	320		28,800	
	3.	20" pipe	support in place	xing @ Folsom	80		12,000	
	4.	Service laterals	replace		18		18,000	
Potable Water Subtotal							265,800	
Auxiliary Water	1.	10"/14" CI pipe	relocate - west	Harrison to Market	2300		322,000	
	2.	12" CI pipe	support in place	3: xing @ Folsom, Howard, Mission	160		16,800	
	3.	8" lateral to hydrants	relocate	2 between Howard/Mission	2		8,800	
	4.	35' X 24" cistern	replace	Beale @ Howard	1		400,000	
Auxiliary Water Subtotal							747,600	
Gas	1.	4" PL pipe	relocate	Harrison to Folsom	500		25,000	
	2.	16" CI pipe	relocate - west	Folsom to Market	1800		225,000	
	3.	3" PL pipe	relocate	xing @ Howard	80		4,000	
	4.	8" CI pipe	relocate	xing @ Mission	80		8,000	
	5.	1" PL pipe - laterals	relocate	2 between Folsom/Howard	160		8,400	
Gas Subtotal							268,400	
Electrical	1.	Small RC box	replace		9		180,000	
	2.	Medium RC box	replace		6		600,000	
	3.	Large RC box	replace		17		8,500,000	
	4.	Active conduit (3"/6")	relocate	Harrison to Market	21600		432,000	
	5.	Trench (18"X40")	relocate	Harrison to Market	2600		104,000	
	6.	Streetlights/signals	replace	Harrison to Market	34		129,200	
Electrical Subtotal							9,945,200	
Communications	1.	Small RC box (PacBell)	replace		9		45,000	
	2.	Medium RC box (PacBell)	replace		9		180,000	
	3.	Large RC box (PacBell)	replace		1		100,000	
	4.	Conduit (27"/4") (PacBell)	relocate	Harrison to Market	29100		291,000	
	5.	Trench (18"X40")	relocate	Harrison to Market	2500		100,000	
Communications Subtotal							716,000	
Segment 3BM Total							12,576,000	

RF = 3030

12,576,000/3030

\$4,150/rel use \$4,127/rel

SEGMENT 3CC: Beale St. (from segment 5)

Bryant to Harrison: cut/cover

Harrison to Mission: cut/cover, 2-level station

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	12"/18" ISP/VCP	relocate	Bryant to Market	3000	110	330,000	816,900
	2.	10" force main	relocate	Bryant to Market	3000	70	210,000	
	3.	24" ISP	support in place	xing @ Bryant	80	130	10,400	
	4.	12" VCP	support in place	xing @ Harrison	80	75	6,000	
	5.	3' X 5' brick	replace/support	xing @ Folsom	100	500	50,000	
	6.	3' X 5' brick	replace/support	xing @ Howard	100	500	50,000	
	7.	3.5' X 5.3' concrete	support in place	xing @ Mission	80	800	64,000	
	8.	Service laterals	replace	for 3'X5' brick (2)	22	1000	22,000	
	9.	Transition structures	new	Bryant to Market	4	3000	12,000	
	10.	Storm drain inlets	replace	Bryant to Market	25	2500	62,500	
Sewer Subtotal							816,900	
Potable Water	1.	12" pipe	relocate	Bryant to Market	3000	90	270,000	340,000
	2.	8"/12" pipe	support in place	5: xing between Bryant/Market	400	90	36,000	
	3.	20" pipe	support in place	xing @ Folsom	80	150	12,000	
	4.	Service laterals	replace		22	1000	22,000	
Potable Water Subtotal							340,000	
Auxiliary Water	1.	10"/16" CI pipe	relocate - west	Bryant to Market	3000	130	390,000	824,400
	2.	12" CI pipe	support in place	3: xing @ Folsom, Howard, Mission	160	105	16,800	
	3.	8" lateral to hydrants	relocate	4 between Bryant/Mission	4	4400	17,600	
	4.	35" X 24" cistern	replace	Beale @ Howard	1	400000	400,000	
Auxiliary Water Subtotal							824,400	
Gas	1.	4" PL pipe	relocate	Bryant to Folsom	1200	50	60,000	306,600
	2.	16" CI pipe	relocate - west	Folsom to Market	1800	125	225,000	
	3.	3" PL pipe	relocate	xing @ Howard	80	50	4,000	
	4.	8" CI pipe	relocate	xing @ Mission	80	100	8,000	
	5.	1" PL pipe - laterals	relocate	3 between Bryant/Howard	240	40	9,600	
Gas Subtotal							306,600	
Electrical	1.	Small RC box	replace		11	20000	220,000	7,735,200
	2.	Medium RC box	replace		8	100000	800,000	
	3.	Large RC box	replace		12	500000	6,000,000	
	4.	Active conduit (3"/6")	relocate	Bryant to Market	22500	20	450,000	
	5.	Trench (18"X40")	relocate	Bryant to Market	3400	40	136,000	
	6.	Streetlights/signals	replace	Bryant to Market	34	3800	129,200	
Electrical Subtotal							7,735,200	
Communications	1.	Small RC box (PacBell)	replace		9	5000	45,000	716,000
	2.	Medium RC box (PacBell)	replace		9	20000	180,000	
	3.	Large RC box (PacBell)	replace		1	100000	100,000	
	4.	Conduit (27/4") (PacBell)	relocate	Harrison to Market	29100	10	291,000	
	5.	Trench (18"X40")	relocate	Harrison to Market	2500	40	100,000	
Communications Subtotal							716,000	

Segment 3CC Total 10,739,100

EF = 2945' 10,739,100 / 2945

= \$ 3,646/kF USE \$ 3,627/kF

Caltrain SF Downhill Station EIS/EIR
Screening Estimate - Utilities
Segment 3CM

SEGMENT 3CM: Beale St. (from segment 2)

Bryant to Harrison: mined tunnel
Harrison to Mission: cut/cover, 2-level station

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	12"/15" ISP/VCP	relocate	Harrison to Market	2300	90	207,000	
	2.	10" force main	relocate	Harrison to Market	2300	70	161,000	
	3.	12" VCP	support in place	xing @ Harrison	80	75	6,000	
	4.	3' X 5' brick	replace/support	xing @ Folsom	100	500	50,000	
	5.	3' X 5' brick	replace/support	xing @ Howard	100	500	50,000	
	6.	3.5' X 5.3' concrete	support in place	xing @ Mission	80	800	64,000	
	7.	Service laterals	replace	for 3'X5' brick (2)	18	1000	18,000	
	8.	Transition structures	new	Harrison to Market	4	3000	12,000	
	9.	Storm drain inlets	replace		20	2500	50,000	618,000
							Sewer Subtotal	
Potable Water	1.	12" pipe	relocate	Harrison to Market	2300	90	207,000	
	2.	8"/12" pipe	support in place	4: xing between Harrison/Market	320	90	28,800	
	3.	20" pipe	support in place	xing @ Folsom	80	150	12,000	
	4.	Service laterals	replace		18	1000	18,000	265,800
							Potable Water Subtotal	
Auxiliary Water	1.	10"/14" CI pipe	relocate - west	Harrison to Market	2300	140	322,000	
	2.	12" CI pipe	support in place	3: xing @ Folsom, Howard, Mission	160	105	16,800	
	3.	8" lateral to hydrants	relocate	2 between Howard/Mission	2	4400	8,800	
	4.	35' X 24' cistern	replace	Beale @ Howard	1	400000	400,000	747,600
							Auxiliary Water Subtotal	
Gas	1.	4" PL pipe	relocate	Harrison to Folsom	500	50	25,000	
	2.	16" CI pipe	relocate - west	Folsom to Market	1800	125	225,000	
	3.	3" PL pipe	relocate	xing @ Howard	80	50	4,000	
	4.	8" CI pipe	relocate	xing @ Mission	80	100	8,000	
	5.	1" PL pipe - laterals	relocate	2 between Folsom/Howard	180	40	7,200	268,400
							Gas Subtotal	
Electrical	1.	Small RC box	replace		9	20000	180,000	
	2.	Medium RC box	replace		6	100000	600,000	
	3.	Large RC box	replace		12	500000	6,000,000	
	4.	Active conduit (3"/6")	relocate	Harrison to Market	21600	20	432,000	
	5.	Trench (18"X40")	relocate	Harrison to Market	2600	40	104,000	
	6.	Streetlights/signals	replace	Harrison to Market	28	3800	106,400	
							Electrical Subtotal	7,422,400
Communications	1.	Small RC box (PacBell)	replace		9	5000	45,000	
	2.	Medium RC box (PacBell)	replace		9	20000	180,000	
	3.	Large RC box (PacBell)	replace		1	100000	100,000	
	4.	Conduit (2"/4") (PacBell)	relocate	Harrison to Market	29100	10	291,000	
	5.	Trench (18"X40")	relocate	Harrison to Market	2500	40	100,000	716,000
							Communications Subtotal	

Segment 3CM Total 10,038,200

10,038,200 / 2420

= 4148/EF USE 4119/EF

RF = 2420

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 4

Prepared by AGS, Inc.
10/3/95

SEGMENT 4: Townsend St.

3rd to Embarcadero: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' x 5' brick	relocate - north	3rd to 2nd	800	500	400,000	
	2.	21" x 24" ISP	relocate - north	2nd to 1st	900	130	117,000	
	3.	8" VCP	support in place	2: xing @ 2nd	40	55	2,200	
	4.	18" x 24" VCP	support in place	2: xing @ 1st	80	130	10,400	
	5.	3' x 5' brick	replace/support	2: xing @ 3rd	50	500	25,000	
	6.	Service laterals	replace	for 3' x 5' brick (2)	1000	28,000	28,000	
	7.	Transition structures	new	3rd to Embarcadero	4	3000	12,000	
	8.	Storm drain inlets	replace	3rd to Embarcadero	16	2500	40,000	634,600
							Sewer Subtotal	
Potable Water	1.	8" pipe	leave in place	3rd to 1st	1800	0	0	
	2.	8" pipe	support in place	3: xing at 3rd, 2nd, 1st	120	75	9,000	
	3.	Service laterals	support in place	10 @ 50' each	500	40	20,000	29,000
							Potable Water Subtotal	
Auxiliary Water	1.	12"/20" CI pipe	relocate	3rd to 2nd	700	130	91,000	
	2.	5' concrete	leave in place	2nd to 1st	800	0	0	
	3.	12" CI pipe	support in place	2: xing @ 2nd	40	90	3,600	
	4.	5' concrete	lower	2: xing @ 1st	100	600	60,000	
	5.	8" laterals to hydrants	support in place	2 between 3rd/2nd	80	65	5,200	159,800
							Auxiliary Water Subtotal	
Gas	1.	6" CI pipe	leave in place	3rd to 2nd	900	0	0	
	2.	4" CI pipe	relocate	2nd to 1st	900	50	45,000	
	3.	4" CI pipe	support in place	2: xing @ 3rd, Embarcadero	80	50	4,000	
	4.	10" CI pipe	extend/support	2: xing @ 3rd	40	110	4,400	
	5.	6" CI pipe	support in place	2: xing @ 2nd, Embarcadero	80	90	7,200	
	6.	1" PL pipe laterals	support in place	8 between 3rd/1st	320	40	12,800	73,400
							Gas Subtotal	
Electrical	1.	Small RC box	replace		7	20000	140,000	
	2.	Medium RC box	replace		5	100000	500,000	
	3.	Large RC box	replace		2	500000	1,000,000	
	4.	Active conduit (3"/6")	relocate	3rd to 1st	2870	20	57,400	
	5.	Trench (18"x40")	relocate	3rd to 1st	1670	40	66,800	
	6.	Streetlights/signals	replace	3rd to 1st	20	3800	76,000	1,840,200
							Electrical Subtotal	
Communications	1.	Small RC box (PacBell)	replace		9	5000	45,000	
	2.	Medium RC box (PacBell)	replace		2	20000	40,000	
	3.	Conduit (2"/4") (PacBell)	relocate	3rd to 1st	3600	10	36,000	
	4.	Trench (18"x40")	relocate	3rd to 1st	1600	40	64,000	185,000
							Communications Subtotal	

Segment 4 Total 2,922,000

RF = 1830 2,922,000/1830

= \$1596/RF

SEGMENT 5: Embarcadero, Beale St.

Townsend to Bryant: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	2.5' x 3.8' RC	leave in place	Brannan to Bryant	600	0	0	72,500
	2.	7.5' x 6' RC	leave in place	xing @ Brannan	50	850	42,500	
	3.	2.5' x 3.8' RC	leave in place	xing @ Brannan	50	600	30,000	
Sewer Subtotal								
Potable Water	1.	12" pipe	relocate	Townsend to Brannan	1100	90	99,000	99,000
Potable Water Subtotal								
Auxiliary Water								0
Auxiliary Water Subtotal								
Gas								0
Gas Subtotal								
Electrical	1.	Streetlights/signals	replace	Townsend to Brannan	6	3800	22,800	22,800
Electrical Subtotal								
Communications								0
Communications Subtotal								
Segment 5 Total								194,300

RF = 1,301 RF, 300/1301

\$149/RF

NOTE; AS PER PREV. UTILITY ESTIMATE,
THE COST PER ROUTE FOOT WAS \$469/RF
THIS ESTIMATE WAS RECEIVED TOO LATE
TO INCLUDE IN SCREENING ESTIMATE
THEREFORE NUMBER BROUGHT FORWARD
WAS \$469/RF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities

Prepared by: AGS, Inc.
10/3/95

SEGMENT 6A: 7th St., King St.

7th to Berry: surface
Berry to 6th: U-wall
6th to 2nd: cut/cover

Segment 6A

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	4 - 9.5' X 8.3' RC boxes	leave in place	xing @ 7th/Berry	40	0	0	10,706,600
	2.	10' X 7' RC on piles*	reroute to 7th/Berry	xing @ 6th	2000	3000	6,000,000	
	3.	6" φ RC on piles*	consolidate w/ 10' X 7'	xing @ 6th	0	0	0	
	4.	9' X 7' RC on piles*	reroute to 6th	xing @ 5th	1000	2500	2,500,000	
	5.	23' X 2' RC box	support in place	xing @ 5th	60	1000	60,000	
	6.	18" pipe*	empty into 9' X 7'	xing @ 5th	20	110	2,200	
	7.	6.5' φ brick/concrete*	reroute to 5th	xing @ 4th	1000	2000	2,000,000	
	8.	30" force main	relocate around station	xing @ 4th	100	170	17,000	
	9.	21" pipe*	empty into 6.5'	xing @ 4th	20	120	2,400	
	10.	3' X 5' brick	replace/support	xing @ 3rd	50	500	25,000	
	11.	15" VCP	relocate	3rd to 2nd	500	90	45,000	
	12.	Service laterals	replace	for 3'X5' brick	9	1000	9,000	
	13.	Transition structures	new	6th to 2nd	2	3000	6,000	
	14.	Storm drain inlets	replace		16	2500	40,000	
*Consolidate 6th, 5th, and 4th St. sewers in new sewer routed down Townsend and 7th to Berry								Sewer Subtotal
Potable Water	1.	8" pipe	relocate	3rd to 2nd	900	75	67,500	98,250
	2.	18" stl. pipe	leave in place	xing @ Berry	40	0	0	
	3.	8"/12" pipe	relocate around station	2: xing @ 5th, 4th	200	90	18,000	
	4.	8" pipe	support in place	xing @ 3rd	50	75	3,750	
	5.	Service laterals	replace		9	1000	9,000	
								Potable Water Subtotal
Auxiliary Water	1.	14" CI pipe	leave in place	xing @ Berry	100	0	0	18,900
	2.	12" CI pipe	support in place	3: xing @ 6th, 5th, 4th	180	105	18,900	
								Auxiliary Water Subtotal
Gas	1.	2" PL pipe	relocate	3rd to 2nd	500	40	20,000	29,400
	2.	3/4" pipe	support in place	2: xing @ 4th, 3rd	100	50	5,000	
	3.	10" pipe	support in place	xing @ 3rd	40	110	4,400	
								Gas Subtotal
Electrical	1.	Small RC box	replace		4	20000	80,000	378,400
	2.	Medium RC box	replace		1	100000	100,000	
	3.	Active conduit (3"/6")	relocate	3rd to 2nd	2600	20	52,000	
	4.	Trench, joint (18"X40")	relocate	3rd to 2nd	1000	40	40,000	
	5.	Streetlights/signals	replace	7rd to 2nd	28	3800	106,400	
								Electrical Subtotal
Communications	1.	Small RC box (PacBell)	replace		5	5000	25,000	33,000
	2.	Conduit (2"/4") (PacBell)	relocate	3rd to 2nd	800	10	8,000	
								Communications Subtotal

Segment 6A Total 11,264,550

11,264,550/5245

RF = 5245

= \$2,147 / RF Use 2113/RF

Caltrain SF Down Station EIS/EIR
Screening Estimate - Utilities
Segment 6B

SEGMENT 6B: 7th St., King St.

7th - to Irwin: surface
7th - Irwin to Berry: U-wall
Berry to 2nd: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	4 - 9.5' X 8.3' RC boxes	lower	King @ 7th/Berry	1	3000000	3,000,000	
	2.	10' X 7' RC on piles*	reroute to 7th/Berry	King @ 6th	2000	3000	6,000,000	
	3.	6' φ RC on piles*	consolidate w/ 10' X 7'	King @ 6th	0	0	0	
	4.	9' X 7' RC on piles*	reroute to 6th	King @ 5th	1000	2500	2,500,000	
	5.	23' X 2' RC box	support in place	King @ 5th	60	1000	60,000	
	6.	18" pipe*	empty into 9' X 7'	King @ 5th	20	110	2,200	
	7.	6.5' φ brick/concrete*	reroute to 5th	King @ 4th	1000	2000	2,000,000	
	8.	30" force main	relocate around station	King @ 4th	100	170	17,000	
	9.	21" pipe*	empty into 6.5'	King @ 4th	20	120	2,400	
	10.	3' X 5' brick	replace/support	King @ 3rd	50	500	25,000	
	11.	15" VCP	relocate	3rd to 2nd	500	90	45,000	
	12.	Service laterals	replace	for 3'X5' brick	9	1000	9,000	
	13.	Transition structures	new	6th to 2nd	2	3000	6,000	
	14.	Storm drain inlets	replace		18	2500	45,000	
*Consolidate 6th, 5th, and 4th St. sewers in new sewer routed down Townsend and 7th to Berry							Sewer Subtotal	13,711,600
Potable Water	1.	8" pipe	relocate	3rd to 2nd	900	75	67,500	
	2.	18" std. pipe	reroute around U-wall	King @ Berry	200	150	30,000	
	3.	8"/12" pipe	relocate around station	2: King @ 5th, 4th	200	90	18,000	
	4.	8" pipe	support in place	King @ 3rd	50	75	3,750	
	5.	Service laterals	replace		9	1000	9,000	
							Potable Water Subtotal	128,250
Auxiliary Water	1.	14" CI pipe	reroute around U-wall	King @ Berry	200	140	28,000	
	2.	12" CI pipe	support in place	3: King @ 6th, 5th, 4th	180	90	16,200	
							Auxiliary Water Subtotal	44,200
Gas	1.	2" PL pipe	relocate	3rd to 2nd	500	40	20,000	
	2.	37/4" pipe	support in place	2: King @ 4th, 3rd	100	50	5,000	
	3.	10" pipe	support in place	King @ 3rd	40	110	4,400	
							Gas Subtotal	29,400
Electrical	1.	Small RC box	replace		4	20000	80,000	
	2.	Medium RC box	replace		1	100000	100,000	
	3.	Active conduit (37/8")	relocate	3rd to 2nd	2600	20	52,000	
	4.	Trench, joint (18"X40")	relocate	3rd to 2nd	1000	40	40,000	
	5.	Streetlights/signals	replace	7rd to 2nd	30	3800	114,000	
							Electrical Subtotal	386,000
Communications	1.	Small RC box (PacBell)	replace		5	5000	25,000	
	2.	Conduit (27/4") (PacBell)	relocate	3rd to 2nd	800	10	8,000	
							Communications Subtotal	33,000

RF = 5330'
Segment 6B Total 14,332,450
14,332,450/5330
= \$2,689/RF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 7

Prepared by AGS, Inc.
10/3/95

SEGMENT 7: King St., Colin P. Kelly St.

2nd to Bryant: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	18" VCP	relocate	Townsend to Brannan	550	110	60,500	136,750
	2.	8" VCP	support in place	xing @ 2nd	50	55	2,750	
	3.	24" VCP	support in place	xing @ Townsend	50	130	6,500	
	4.	7.5' X 6' RC	support in place	xing @ Brannan	50	850	42,500	
	5.	10" force main	support in place	xing @ Brannan	50	70	3,500	
	6.	Service laterals	replace		6	1000	6,000	
	7.	Storm drain inlets	replace	2nd to Brannan	6	2500	15,000	
Sewer Subtotal								
Potable Water	1.	12" pipe	relocate	Townsend to Brannan	550	40	22,000	39,250
	2.	8" pipe	support in place	3: xing @ 2nd, Townsend, Brannan	150	75	11,250	
	3.	Service laterals	replace		6	1000	6,000	
Potable Water Subtotal								
Auxiliary Water	1.	5" concrete	lower	xing @ Townsend	100	600	60,000	66,500
	2.	16" CI pipe	support in place	xing @ Brannan	50	130	6,500	
Auxiliary Water Subtotal								
Gas	1.	2" PL pipe	relocate	Townsend to Brannan	550	40	22,000	35,500
	2.	4" PL pipe	support in place	3: xing @ 2nd, Townsend, Brannan	150	90	13,500	
Gas Subtotal								
Electrical	1.	Small RC box	replace	2nd, Colin P. Kelly	2	20000	40,000	75,900
	2.	Active conduit (3"/6")	relocate	2nd, Colin P. Kelly	275	20	5,500	
	3.	Streetlights/signals	replace	2nd, Colin P. Kelly	8	3800	30,400	
Electrical Subtotal								
Communications	1.	Small RC box (Pac Bell)	replace	2nd, Colin P. Kelly	4	5000	20,000	70,250
	2.	Conduit (27/4") (Pac Bell)	relocate	2nd, Colin P. Kelly	1025	10	10,250	
	3.	Trench, joint (18" X 40")	relocate	2nd, Colin P. Kelly	1000	40	40,000	
Communications Subtotal								
Segment 7 Total								424,150

RF = 1985' 424,150 / 1985

= \$225/RF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 8

Prepared by: AGS, Inc.
10/3/95

SEGMENT 8: Between 1st and 2nd, under Essex

Bryant to Folsom: tunnel

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	leave in place	king @ Bryant	50	0	0	0
							Sewer Subtotal	0
Potable Water							0	0
							Potable Water Subtotal	0
Auxiliary Water							0	0
							Auxiliary Water Subtotal	0
Gas							0	0
							Gas Subtotal	0
Electrical	1.	230 kV tar-enamel line	leave in place	king @ Harrison	50	0	0	0
							Electrical Subtotal	0
Communications							0	0
							Communications Subtotal	0
Segment 8 Total								0

NOTE: AS PER PREV. UTILITY
ESTIMATE, A PORTION OF SEGMENT
NINE'S SEGMENT WAS SHIFTED TO
SEGMENT EIGHT. THIS ESTIMATE
WAS RECEIVED TOO LATE TO ADJUST
SCREENING ESTIMATE. THEREFORE ESTIMATE
USES \$135/RF.

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 9A

Prepared by: AGS, Inc.
10/3/95

SEGMENT 9A: Between 1st and 2nd, then to Beale St.

Folsom to Beale: aerial

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	replace/support	xing @ Folsom	80	500	40,000	40,000
							Sewer Subtotal	
Potable Water	1.	20" pipe	support in place	xing @ Folsom	80	150	12,000	
	2.	6" pipe	support in place	xing @ Folsom	80	65	5,200	
							Potable Water Subtotal	17,200
Auxiliary Water	1.	12" pipe	support in place	xing @ Folsom	80	105	8,400	8,400
							Auxiliary Water Subtotal	
Gas	1.	16" CI pipe	support in place	xing @ Folsom	80	125	10,000	
	2.	6" CI pipe	support in place	xing @ Folsom	80	90	7,200	
							Gas Subtotal	17,200
Electrical	1.	230 kV tar-enamel line	support in place	xing @ Folsom	80	400	32,000	
	2.	RC boxes	relocate	@ Folsom	0	0	0	
	3.	Active conduit (3"/6")	support in place	xing @ Folsom (2 duct banks)	2	10000	20,000	
							Electrical Subtotal	52,000
Communications	1.	RC boxes	relocate	@ Folsom	0	0	0	
	2.	Conduit (2"/4")	support in place	xing @ Folsom (1 duct bank)	1	10000	10,000	
							Communications Subtotal	10,000

Aerial structure column locations not yet defined. Allowance for utility relocation due to column foundation interferences. 500,000

Segment 9A Total 644,800

NOTE; AS PER PREV. UTILITY
ESTIMATE, A PORTION OF SEGMENT 9A
WAS SHIFTED TO SEGMENT 8, THIS
ESTIMATE WAS RECEIVED TOO LATE TO
ADJUST SCREENING ESTIMATE.
THEREFORE, USE \$207/CF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 9B

Prepared by AGS, Inc.
10/3/95

SEGMENT 9B: Between 1st and 2nd, then to Beale St.

Folsom to Beale: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT	COST	TOTALS
Sewer	1.	3' X 5' brick	replace/reroute/support	6: xing @ Folsom, Clementina, Tehama, Howard, Natoma, 1st	480		500	240,000
	2.	12" VCP	support in place	2: xing @ Fremont, Beale	160		75	12,000
	3.	10" force main	support in place	xing @ Beale	80		70	5,600
Sewer Subtotal								257,600
Potable Water	1.	20" pipe	support in place	xing @ Folsom	80		150	12,000
	2.	12" pipe	support in place	xing @ Beale	80		90	7,200
	3.	8" pipe	support in place	3: xing @ Howard, 1st, Fremont	240		75	18,000
	4.	4" PL pipe	support in place	4: @ Folsom, Clementina, Tehama, Natoma	320		65	20,800
Potable Water Subtotal								58,000
Auxiliary Water	1.	10" PL pipe	support in place	3: xing @ Howard, 1st	240		105	25,200
	Auxiliary Water Subtotal							25,200
Gas	1.	16" CI pipe	support in place	2: xing @ Folsom, Beale	160		125	20,000
	2.	12" CI pipe	support in place	xing @ Howard	80		115	9,200
	3.	6" CI pipe	support in place	xing @ Folsom	80		90	7,200
	4.	2" PL pipe	support in place	8: xing @ Clementina, Tehama, Howard, Natoma, 1st, Fremont	640		50	32,000
Gas Subtotal								68,400
Electrical	1.	230 KV far-enamel line	support in place	xing @ Folsom	80		400	32,000
	2.	Small RC box	replace		1		20000	20,000
	3.	Medium RC box	replace		3		100000	300,000
	4.	Large RC box	replace		2		500000	1,000,000
	5.	Active conduit (3" / 6")	support in place	xing between Folsom/Beale	8000		20	160,000
Electrical Subtotal								1,512,000
Communications	1.	Small RC boxes	replace		3		5000	15,000
	2.	Conduit (2" / 4")	support in place	xing between Folsom/Beale	5400		10	54,000
Communications Subtotal								69,000
Segment 9B Total								1,990,200

NOTE: AS PER PREV UTILITY ESTIMATE, A PORTION
OF SEGMENT 9B WAS SHIFTED TO SEGMENT B.
THIS ESTIMATE WAS RECEIVED TOO LATE TO AVOID
SCREENING ESTIMATE, THEREFORE USE \$ 771/RF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 10

SEGMENT 10: Townsend St., Colin P. Kelly St.
3rd to Bryant: cut/cover

Prepared by: AGS, Inc.
10/3/95

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer								
	1.	3' X 5' brick	relocate - west	3rd to 2nd	800	500	400,000	
	2.	18" VCP	relocate	Townsend to Brannan	350	110	38,500	
	3.	3' X 5' brick	replace/support	xing @ 3rd	50	500	25,000	
	4.	8" VCP	support in place	xing @ 2nd	40	55	2,200	
	5.	21" VCP	extend/support	xing @ 2nd	60	120	7,200	
	6.	7.5' X 6' RC	support in place	xing @ Brannan	50	850	42,500	
	7.	10" force main	support in place	xing @ Brannan	50	70	3,500	
	8.	Service laterals	replace		19	1000	19,000	
	9.	Transition structures	new	3' X 5' brick (2)	4	3000	12,000	
	10.	Storm drain inlets	replace	3rd to Brannan	6	2500	15,000	
								Sewer Subtotal
								564,900
Potable Water								
	1.	8" pipe	leave in place	3rd to 2nd	900	0	0	
	2.	2" pipe	relocate	Townsend to Brannan	350	40	14,000	
	3.	8" pipe	support in place	4: xing @ 3rd, 2nd, Brannan	230	75	17,250	
	4.	Service laterals	support in place	9 @ 50' each	450	40	18,000	
								Potable Water Subtotal
								49,250
Auxiliary Water								
	1.	12"/20" CI pipe	relocate	3rd to 2nd	700	130	91,000	
	2.	5" RC	lower	xing @ 2nd	100	600	60,000	
	3.	12" CI pipe	support in place	xing @ 2nd	50	105	5,250	
	4.	16" CI pipe	support in place	xing @ Brannan	50	130	6,500	
	5.	8" laterals to hydrants	support in place	2 between 3rd/2nd	80	65	5,200	
								Auxiliary Water Subtotal
								167,950
Gas								
	1.	8" CI pipe	leave in place	3rd to 2nd	900	0	0	
	2.	2" PL pipe	relocate	Townsend to Brannan	350	40	14,000	
	3.	4"/6" CI pipe	support in place	4: xing @ 3rd, 2nd, Brannan	230	90	20,700	
	4.	10" CI pipe	extend/support	xing @ 3rd	40	110	4,400	
	5.	1" PL pipe-laterals	support in place	7 between 3rd/2nd	280	40	11,200	
								Gas Subtotal
								50,300
Electrical								
	1.	Small RC box	replace		7	20000	140,000	
	2.	Medium RC box	replace		5	100000	500,000	
	3.	Large RC box	replace		2	500000	1,000,000	
	4.	Active conduit (3"/6")	relocate	3rd to 2nd, Colin P. Kelly	2300	20	46,000	
	5.	Trench (18" X 40")	relocate	3rd to 2nd, Colin P. Kelly	1100	40	44,000	
	6.	Streetlights/signals	replace	3rd to 2nd, Colin P. Kelly	12	3800	45,600	
								Electrical Subtotal
								1,775,600
Communications								
	1.	Small RC box (PacBell)	replace		10	5000	50,000	
	2.	Medium RC box (PacBell)	replace		2	20000	40,000	
	3.	Conduit (27/4") (PacBell)	relocate	3rd to 2nd, Colin P. Kelly	3725	10	37,250	
	4.	Trench (18" X 40")	relocate	3rd to 2nd, Colin P. Kelly	1300	40	52,000	
								Communications Subtotal
								179,250

RF = 2380
2,787,250 / 2380 = \$1,171/RF
Segment 10 Total 2,787,250

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 11

Prepared by AGS, Inc
10/3/95

SEGMENT 11: Begin Townsend St., End Bryant St. (link segments 1 and 8) 3rd to Bryant: mined tunnel

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	relocate	2. xing @ 3rd	250	500	125,000	144,500
	2.	Transition structures	new	for 3' X 5' brick (2)	4	3000	12,000	
	3.	Storm drain inlets	replace	@ 3rd	3	2500	7,500	
Sewer Subtotal							144,500	
Potable Water	1.	6"/8" pipe	support in place	2. xing @ 3rd	200	75	15,000	15,000
Potable Water Subtotal							15,000	
Auxiliary Water	1.	12" pipe	support in place	xing @ 3rd	150	105	15,750	19,000
	2.	8" lateral to hydrant	extend/support	xing @ 3rd	50	65	3,250	
Auxiliary Water Subtotal							19,000	
Gas	1.	4"/6" CI pipe	support in place	2. xing @ 3rd	200	90	18,000	23,500
	2.	10" CI pipe	extend/support	xing @ 3rd	50	110	5,500	
Gas Subtotal							23,500	
Electrical	1.	Medium RC box	replace	3rd	2	100000	200,000	257,200
	2.	Active conduit (3"/6")	relocate	3rd	1900	20	38,000	
	3.	Trench (18"X40")	relocate	3rd	100	40	4,000	
	4.	Streetlights/signals	replace	3rd	4	3800	15,200	
Electrical Subtotal							257,200	
Communications	1.	Small RC box (PacBell)	replace	3rd	1	5000	5,000	37,000
	2.	Medium RC box (PacBell)	replace	3rd	1	20000	20,000	
	3.	Conduit (2"/4") (PacBell)	relocate	3rd	800	10	8,000	
	4.	Trench (18"X40")	relocate	3rd	100	40	4,000	
Communications Subtotal							37,000	
Segment 11 Total							496,200	

DF = 2,148' \$496,200/2,148

= \$231/DF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 12

Prepared by AGS, Inc.
10/3/95

SEGMENT 12: King St., Embarcadero

2nd to 1st: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	17.5" wide RC box	leave in place	2nd to Embarcadero	650	0	0	50,750
	2.	8" VCP	support in place	xing @ 2nd	50	55	2,750	
	3.	18"/24"	support in place	2: xing @ Townsend	100	130	13,000	
	4.	Storm drain inlets	replace	2nd to Embarcadero	14	2500	35,000	
							Sewer Subtotal	
Potable Water	1.	12" pipe	relocate	@ Townsend/Embarcadero	350	90	31,500	35,250
	2.	8" pipe	support in place	xing @ 2nd	50	75	3,750	
							Potable Water Subtotal	
Auxiliary Water	1.	5" concrete	lower	xing @ Townsend	100	600	60,000	60,000
							Auxiliary Water Subtotal	
Gas	1.	6" pipe	support in place	xing @ 2nd	50	90	4,500	7,000
	2.	4" pipe	support in place	xing @ Townsend	50	50	2,500	
							Gas Subtotal	
Electrical	1.	Streetlights/signals	replace	2nd to 1st	14	3800	53,200	53,200
							Electrical Subtotal	
Communications							Communications Subtotal	0
							Segment 12 Total	206,200

$$RF = 1208' \quad 206,200 / 1208 = \$170/RF$$

NOTE: THIS ESTIMATE REPLACES THE
PREV. ESTIMATE OF \$469/RF. HOWEVER
THIS EVALUATION WAS RECEIVED TO DATE
TO INCLUDE IN TOTAL ESTIMATE. NUMBER
CURRENT PERMANENT CIPS \$469/RF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment SW3

SEGMENT SW3: Satellite Storage Yard (16th St./I-280)

16th to Berry: at-grade

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	66" force main	leave in place	16th to Berry	2300	0	0	14,850
	2.	8" VCP	reinforce/sleeve	king near 16th	270	55	14,850	
Sewer Subtotal							14,850	
Potable Water	1.	12" pipe	reinforce/sleeve	king @ Hooper	270	150	40,500	
Potable Water Subtotal							40,500	
Auxiliary Water								
Auxiliary Water Subtotal							0	
Gas								
Gas Subtotal							0	
Electrical								
Electrical Subtotal							0	
Communications								
Communications Subtotal							0	
Segment SW3 Total							55,350	

THIS ESTIMATE REFINES THE
PREV. ESTIMATE \$47,250. HOWEVER
THIS EVALUATION WAS MADE TO DATE
TO INCLUDE IN TOTAL ESTIMATE.
NUMBER BROUGHT FORWARD WAS

\$47,250

Screening Estimate - Utilities
Segment SW4

SEGMENT SW4: Satellite Storage Yard (Bayshore in Brisbane)

77: at-grade

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer								
							Sewer Subtotal	0
Potable Water								
							Potable Water Subtotal	0
Auxiliary Water								
							Auxiliary Water Subtotal	0
Gas								
							Gas Subtotal	0
Electrical								
							Electrical Subtotal	0
Communications								
							Communications Subtotal	0
Segment SW4 Total								0

*Utility impacts for SW4 unknown at this time.

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Unit Cost Summary

Prepared by AGS, Inc.
10/3/95

UTILITY	ITEM	UNIT COST
Sewer	8" VCP	55
	12" VCP	75
	15" VCP	90
	18" VCP	110
	21" VCP	120
	24" VCP	130
	10" force main	70
	30" force main	170
	3' X 5' brick	500
	Transition structure (for 3'X5')	3,000
	Service laterals (per foot)	50
	Service laterals (unit)	1,000
	Storm drain inlets	2,500
Potable Water	2" DI	40
	4" DI	55
	6" DI	65
	8" DI	75
	12" DI	90
	18" steel	150
	20" steel	150
	Service laterals (per foot)	40
	Service laterals (unit)	1,000
Auxiliary Water	10" DI	105
	12" DI	105
	14" DI	140
	16" steel	130
	20" steel	130
	8" lateral to hydrant	65
	5' dia. concrete (lower)	600
	35' X 24' cistern	400,000
Gas	1"/2" PL	40
	3" PL	50
	4" PL	50
	6" PL	90
	8" CI	100
	10" CI	110
	12" CI	115
	16" CI	125
Electrical	Small RC box	20,000
	Medium RC box	100,000
	Large RC box	500,000
	Active conduit (3"/6")	20

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Unit Cost Summary

Prepared by AGS, Inc.
10/3/95

	Trench (18"X40")	40
	Overhead power pole	15,000
	Streetlight	3,800
	Traffic signal	
	230 kV tar-enamel line	400
Communications	Small RC box	5,000
	Medium RC box	20,000
	Large RC box	100,000
	Conduit (2"/4")	10
	Trench (18"X40")	40



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SUMMARY OF ROADWAY MODIFICATION ESTIMATES

10/02/95
BY BCC/RLM

FAC. #	DESCRIPTION	NO. OF TRACKS	RF	TOTAL DOLLARS	COST \$/RF	COMMENTS
01A0	SEGMENT 1A	2	3950	\$492,471	\$125	
01B0	SEGMENT 1B	2	4780	\$1,436,342	\$300	
0200	SEGMENT 2	2	2720	\$90,815	\$33	
03BC	SEGMENT 3BC	4	3515	\$2,003,149	\$570	
03BM	SEGMENT 3BM	2	3030	\$1,429,518	\$472	
03CC	SEGMENT 3CC	2	2945	\$1,380,216	\$469	
03CM	SEGMENT 3CM	2	2420	\$935,931	\$387	
0400	SEGMENT 4	2	1830	\$614,812	\$336	
0500	SEGMENT 5	2	1301	\$388,332	\$298	
0700	SEGMENT 7	2	1885	\$60,501	\$32	

--- FACIL.STANDRD.WKPKG =====	DESCRIPTION =====	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS =====
01A0	SEGMENT - 1A									
01A0 .0282455.	STREET -ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	23111 SY	2034	0	0	0	1039995	0	52000	1091995
01A0 .0287351.	6" X 8" CONC CURB & GUTTER	13000 LF	1950	0	0	0	260000	0	13000	273000
01A0 .0287361.	6" CONC SIDEWALK	67200 SF	3629	0	0	0	2768664	0	13843	290707
01A0 .0287373.	ALLOWANCE FOR PLANTERS, FURNITURE, RAMPS & PAVEMENT PAINTING	3250 RF	3250	0	0	0	32500	0	1625	34125
TOTAL SEGMENT - 1A			10,863	0	0	0	1,609,359	0	80,468	1,689,827

NOTE : THIS ESTIMATE REPAIRS THE
PREV. ESTIMATE OF \$492,471.
HOWEVER THIS EVALUATION WAS MADE
TOO LATE TO INCLUDE IN TOTAL
ESTIMATE. NUMBER BROUGHT FORWARD
WAS \$492,471.

--- FACIL. STANDRD. WPKG =====	DESCRIPTION =====	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS =====
0180	SEGMENT - 1B									
0180 .0282455.	STREET - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	21856 SY	1923	0	0	0	983520	0	49176	1032696
0180 .0287351.	6" X 8" CONC CURB & GUTTER	6300 LF	945	0	0	0	126000	0	6300	132300
0180 .0287361.	6" CONC SIDEWALK	77000 SF	4158	0	0	0	317240	0	15862	333102
0180 .0287373.	ALLOWANCE FOR PLANTERS, FURNITURE, RAMPS & PAVEMENT PAINTING	3150 RF	3150	0	0	0	31500	0	1575	33075
TOTAL	SEGMENT - 1B		10,176	0	0	0	1,458,260	0	72,913	1,531,173

NOTE : THIS ESTIMATE REPLACES THE
PREV. ESTIMATE OF \$1,436,342.
HOWEVER THIS EVALUATION WAS
MADE TOO LATE TO INCLUDE IN
TOTAL ESTIMATE, NUMBER BROUGHT
FORWARD WAS \$1,436,342.

--- FACIL.STANDRD.WKPKG =====	DESCRIPTION =====	QUANTITY =====	MANHOURS =====	LABOR =====	EQUIP USAGE =====	MATERIAL =====	SUB- CONTRACT =====	EQUIP- MENT =====	OH&P =====	TOTAL DOLLARS =====
0200	SEGMENT - 2									
0200 .0282451.	PARKING - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	300 SY	20	0	0	0	10500	0	525	11025
0200 .0282455.	STREET - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	1350 SY	119	0	0	0	60750	0	3038	63788
0200 .0287351.	6" X 8" CONC CURB & GUTTER	200 LF	30	0	0	0	4000	0	200	4200
0200 .0287361.	6" CONC SIDEWALK	2000 SF	108	0	0	0	8240	0	412	8652
0200 .0287373.	ALLOWANCE FOR PLANTERS, FURNITURE, RAMPS & PAVEMENT PAINTING	300 RF	300	0	0	0	3000	0	150	3150
TOTAL	SEGMENT - 2		577	0	0	0	86,490	0	4,325	90,815

---WORK BREAKDOWN---									
FACIL.STANDRD.WKPKG									
	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP - MENT	TOTAL DOLLARS
=====									
03BC	SEGMENT - 3BC								
03BC .0282451.	PARKING - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	4710 SY	316	0	0	0	164850	0	8243 173093
03BC .0282455.	STREET - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	17460 SY	1536	0	0	0	785700	0	39285 824985
03BC .0287351.	6" X 8" CONC CURB & GUTTER	7700 LF	1155	0	0	0	154000	0	7700 161700
03BC .0287361.	6" CONC SIDEWALK	185000 SF	9990	0	0	0	762200	0	38110 800310
03BC .0287373.	ALLOWANCE FOR PLANTERS, FURNITURE, RAMPS & PAVEMENT PAINTING	4101 RF	4101	0	0	0	41010	0	2051 43061

TOTAL	SEGMENT - 3BC		17,098	0	0	0	1,907,760	0	95,389 2,003,149

--- FACIL.STANDRD.WKPKG =====	DESCRIPTION =====	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS =====
038M	SEGMENT - 38M									
038M .0282451.	PARKING - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	4710 SY	316	0	0	0	164850	0	8243	173093
038M .0282455.	STREET - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	13265 SY	1167	0	0	0	596925	0	29846	626771
038M .0287351.	6" X 8" CONC CURB & GUTTER	5800 LF	870	0	0	0	116000	0	5800	121800
038M .0287361.	6" CONC SIDEWALK	109920 SF	5936	0	0	0	452870	0	22644	475514
038M .0287373.	ALLOWANCE FOR PLANTERS, FURNITURE, RAMPS & PAVEMENT PAINTING	3080 RF	3080	0	0	0	30800	0	1540	32340
TOTAL SEGMENT - 38M			11,369	0	0	0	1,361,445	0	68,073	1,429,518

ICF KAISER ENGINEERS, INC.
SAN FRANCISCO, CALIFORNIA
JOB NO. 65928-005-05

ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
CALTRAIN DOWNTOWN EXTENSION
REPORT D1 - ESTIMATE DETAIL BY FACILITY

PAGE 6
DATE: 10/02/95 16:43
BY BCC/RLM/HWH

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
=====											
03CC		SEGMENT - 3CC									
03CC .0282451.		PARKING - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	3050 SY	204	0	0	0	106750	0	5338	112088
03CC .0282455.		STREET - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	12850 SY	1131	0	0	0	578250	0	28913	607163
03CC .0287351.		6" X 8" CONC CURB & GUTTER	5550 LF	833	0	0	0	111000	0	5550	116550
03CC .0287361.		6" CONC SIDEWALK	119000 SF	6426	0	0	0	490280	0	24514	514794
03CC .0287373.		ALLOWANCE FOR PLANTERS, FURNITURE, RAMPS & PAVEMENT PAINTING	2821 RF	2821	0	0	0	28210	0	1411	29621

TOTAL				11,415	0	0	0	1,314,490	0	65,726	1,380,216

--WORK BREAKDOWN---		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL.STANDRD.WKPKG		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
0400		SEGMENT - 4									
0400 .0282451.		PARKING - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	2600 SY	174	0	0	0	91000	0	4550	95550
0400 .0282455.		STREET - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	8135 SY	716	0	0	0	366075	0	18304	384379
0400 .0287351.		6" X 8" CONC CURB & GUTTER	1800 LF	270	0	0	0	36000	0	1800	37800
0400 .0287361.		6" CONC SIDEWALK	18000 SF	972	0	0	0	74160	0	3708	77868
0400 .0287373.		ALLOWANCE FOR PLANTERS, FURNITURE, RAMPS & PAVEMENT PAINTING	1830 RF	1830	0	0	0	18300	0	915	19215
TOTAL		SEGMENT - 4		3,962	0	0	0	585,535	0	29,277	614,812

---WORK BREAKDOWN---	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL.STANDARD.WKPKG										
0500	SEGMENT - 5									
0500 .0282451.	PARKING - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	3050 SY	204	0	0	0	106750	0	5338	112088
0500 .0282455.	STREET - ASPHALTIC CONCRETE OVER AGGREGATE BASE INCL SUBGRADE PREP	2950 SY	260	0	0	0	132750	0	6638	139388
0500 .0282458.	COBBLESTONE MEDIAN	13275 SF	2390	0	0	0	46463	0	2323	48786
0500 .0287351.	6" X 8" CONC CURB & GUTTER	1740 LF	261	0	0	0	34800	0	1740	36540
0500 .0287361.	6" CONC SIDEWALK	8550 SF	462	0	0	0	35226	0	1761	36987
0500 .0287373.	ALLOWANCE FOR PLANTERS, FURNITURE, RAMPS & PAVEMENT PAINTING	1385 RF	1385	0	0	0	13850	0	693	14543
TOTAL	SEGMENT - 5		4,962	0	0	0	369,839	0	18,493	388,332



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.

STRUCTURAL MODIFICATIONS, UNDERPINNING, MITIGATIONS

09/25/95
BY BCC/RLM

SEGMENT DESCRIPTION	SEG. #	STRUCT. MODS	UNDER - PINNING	MITIGATIONS HAZ. WASTE	MITIGATIONS URBAN DESIGN	TOTAL MITIGATIONS
APPROX. IRWIN & SEVENTH TO APPROX. THIRD & TOWNSEND VIA CUT -AND- COVER CONSTRUCTION. PORTAL ON TOWNSEND BETWEEN FIFTH AND FOURTH.	1A				\$500,000	\$500,000
APPROX. IRWIN & SEVENTH TO APPROX. THIRD & TOWNSEND VIA CUT -AND- COVER CONSTRUCTION. PORTAL ON SEVENTH NEAR BERRY.	1B				\$500,000	\$500,000
APPROX. THIRD & TOWNSEND TO BRYANT VIA MINED TUNNEL CONSTRUCTION.	2		\$1,500,000			\$0
APPROX. BEALE AND BRYANT TO A THREE LEVEL CENTER PLATFORM UNDERGROUND (CUT- AND - COVER) TERMINAL AT MARKET/BEALE.	3AC	\$5,000,000	\$3,000,000	\$1,000,000	\$500,000	\$1,500,000
APPROX. BRYANT TO A THREE LEVEL SIDE PLATFORM UNDERGROUND (CUT-AND- COVER) TERMINAL AT MARKET/BEALE.	3AM	\$5,000,000	\$2,000,000	\$1,000,000	\$500,000	\$1,500,000
APPROX. BEALE AND BRYANT TO A TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT- AND - COVER) STAGGERED TERMINAL AT MARKET/BEALE.	3BC	\$5,500,000	\$2,500,000	\$1,900,000	\$500,000	\$2,400,000
APPROX. BRYANT ST. TO A TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT -AND- COVER) STAGGERED TERMINAL AT MARKET/BEALE.	3BM	\$5,500,000	\$2,000,000	\$1,900,000	\$500,000	\$2,400,000
APPROX. BEALE AND BRYANT TO A NEW TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT- AND - COVER) TERMINAL BETWEEN MISSION AND FOLSOM.	3CC	\$500,000	\$2,500,000	\$1,900,000	\$500,000	\$2,400,000
APPROX. BRYANT ST. TO A NEW TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT -AND- COVER) TERMINAL BETWEEN MISSION AND FOLSOM.	3CM	\$500,000	\$2,000,000	\$1,900,000	\$500,000	\$2,400,000
APPROX. THIRD AND TOWNSEND TO DELANCEY AND TOWNSEND, VIA CUT -AND- COVER CONSTRUCTION.	4			\$150,000		\$150,000



ICF KAISER

CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.

STRUCTURAL MODIFICATIONS, UNDERPINNING, MITIGATIONS

09/25/95

BY BCC/RLM

SEGMENT DESCRIPTION	SEG. #	STRUCT. MODS	UNDER-PINNING	MITIGATIONS IIAZ. WASTE	MITIGATIONS URBAN DESIGN	TOTAL MITIGATIONS
APPROX. DELANCEY AND EMBARCADERO TO BRYANT AND BEALE, VIA CUT-AND-COVER UNDER THE EMBARCADERO	5					\$0
APPROX. IRWIN & SEVENTH TO APPROX. SECOND & KING VIA CUT-AND-COVER CONSTRUCTION. PORTAL ON KING 400' EAST OF SIXTH ST.	6A			\$40,000	\$500,000	\$540,000
APPROX. IRWIN & SEVENTH TO APPROX. 2ND & KING VIA CUT-AND-COVER CONSTRUCTION. PORTAL ON SEVENTH NEAR BERRY.	6B			\$40,000	\$500,000	\$540,000
SECOND & KING TO BRYANT & COLIN P. KELLY, VIA COLIN P. KELLY	7		\$300,000	\$130,000		\$130,000
BRYANT & COLIN P. KELLY TO FOLSOM PORTAL, VIA MINED TUNNEL CONSTRUCTION.	8					\$0
FOLSOM PORTAL, AERIAL TO NEW AERIAL TERMINAL ON TRANSBAY SITE	9A				\$2,000,000	\$2,000,000
FOLSOM TO NEW UNDERGROUND TERMINAL ON TRANSBAY SITE	9B			\$1,290,000	\$1,500,000	\$2,790,000
APPROX. THIRD & TOWNSEND TO BRYANT & COLIN P. KELLY, VIA SHORT RADIUS TURN.	10		\$1,000,000			\$0
APPROX. THIRD & TOWNSEND TO BRYANT & COLIN P. KELLY, VIA LONG RADIUS TURN.	11		\$1,000,000			\$0
KING AND 2ND TO APPROX. DELANCEY AND THE EMBARCADERO VIA CUT-AND-COVER.	12					\$0
TRACTION POWER (DWTN SAN FRANCISCO TO GILROY)	SW1					\$0



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.

STRUCTURAL MODIFICATIONS, UNDERPINNING, MITIGATIONS

09/25/95
BY BCC/RLM

SEGMENT DESCRIPTION	SEG. #	STRUCT. MODS	UNDER - PINNING	MITIGATIONS HAZ. WASTE	MITIGATIONS URBAN DESIGN	TOTAL MITIGATIONS
TRACTION POWER (DWTN SAN FRANCISCO TO IRWIN)	SW2					\$0
SATELLITE STORAGE YARD (16TH STREET / I-280)	SW3					\$0
SATELLITE STORAGE YARD (BAYSHORE IN BRISBANE)	SW4					\$0
PULLMAN WAY, SAN JOSE L.N.G. FUELING FACILITY	SW5					\$0
NEW ELECTRIC LOCOMOTIVES	SW6					\$0
NEW DUAL-MODE LOCOMOTIVES	SW7					\$0
DIESEL LOCOMOTIVE CONVERSION TO L.N.G.	SW8					\$0
CLEAN DIESEL LOCOMOTIVE UPGRADE	SW9					\$0
MISC. SYSTEM WIDE ELEMENTS	SW10					\$0

TITLE Colt in DTXJOB NO. 622-0550

CLIENT _____ LOCATION _____

DATE 9/25/95SUBJECT Underpinning-BY H.W.HHarrison St. BridgeSHEET 1 OF 1

CHECKED BY _____

CODE	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT	TOTAL
1	Per Dames & Moore - Plate 6-84				
2	Bridge Width = 80'				
3					
4					
5					
6	Auger 24" ϕ Holes	2880 LF	55 ⁰⁰	158400	
7	H-Files W14x82	2880 LF	48 ⁰⁰	138240	
8	Wales	960 LF	60 ⁰⁰	57600	
9	Wire Mesh w/6" Shotcrete	11200 SF	25 ⁰⁰	280000	
10	Rock Bolts 1" ϕ x 60'	108 Ea	525 ⁰⁰	56700	
11	2" ϕ Grout Holes From Piers	4320 LF	9 ⁰⁰	38880	
12	Rock Bolts From Piers	36 Ea	1747 ⁰⁰	62954	
13					
14	Subtotal			792784	
15					
16	Difficulty Factor			x1.15	
17					
18					
19	Total Est. Cost				911702
20					
21					
22	SEGMENT 3A No DETAILS			USE	\$1000000
23					
24	3 B No DETAILS			USE	500000
25					
26	3 C No DETAILS			USE	500000
27					
28					
29					
30					
31					
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39					
40					

CALTRANS EXTENSION

DESIGNED BY RLS DATE 10/2/12

CHECKED BY DATE

SEGMENT 3, UNDERPINNING (IN BEALE ST)

ASSUME TTT IS STILL IN BUSINESS & WE
CAN'T INTERRUPT BUS TRAFFIC ON DECKS
WITH PASS OVER BEALE

TEMPORARILY SUPPORT SUPERSTRUCTURE,
REMOVE EXISTING SUBSTRUCTURE &
REBUILD SUPPORTS W/ INTEGRATION INTO
CALTRANS BOX.

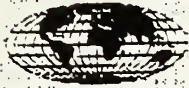
- a. TEMPORARY SUPPORT = \$200,000
- b. REMOVAL OF EXISTING = \$200,000
SUBSTRUCTURE
- c. CONSTRUCTION OF NEW
SUPPORTS: $170(90) @ \$30/SF = \$765,000$
- d. BEEF UP EXISTING SUPER
TO HANDLE LONGER SPANS
 $(170 \times 90) @ \$30/SF = \$459,000$

\$1,800,000

USE \$2,000,000

MITIGATION

Ben Cavin

OFFICE MEMORANDUM
SAN FRANCISCO • OAKLAND • BEDM

ACTION		INFO
To:	Dave Minister, ICF Kaiser	Dale Shileikis, Dames & Moore Davis Mansen, De Leuw, Cather
		Date: September 15, 1995 File: 30752-003
From:	Mark G. Filippini, CEG <i>MGF</i>	
Subject:	CalTrain Corridor Study, Amendment 2 Supplemental Hazardous Materials Evaluation	

This memorandum presents our preliminary evaluation of the impacts of hazardous materials on the additional CalTrain relocation alternatives 2D and 2E per Amendment 2 of our contract. The additional alternatives include the widening of the underground portion of the train terminal to include an approximate additional 80 feet of the block immediately east of Beale Street between Mission and Folsom streets. This would bring the total width of the terminal to approximately 160 feet. The depth of the excavation would be approximately 55 feet. You have asked that we evaluate the impacts of the proposed terminal with respect to the quantity of hazardous materials that could be encountered in the excavation and both unit and total costs to remove and dispose of the material.

Our preliminary evaluations presented in our August 1 memo and our draft Setting Section identified the area near the intersection of Beale and Howard streets as an area known to contain significant quantities of PNA-containing soil. The sources of the PNA's was a coal gasification plant that existed near Fremont and Howard streets that generated coal tar as a byproduct during the turn of the century. The coal tar was discharged directly into the Bay at Yerba Buena Cove along what is now Howard and Beale streets. Yerba Buena cove was later filled as reclaimed land. Coal tar is known to exist on top of the old Bay Mud deposits along Beale Street from approximately Mission to Folsom streets. It is believed to extend as far west as Fremont Street and as far east as the Embarcadero. The San Francisco Muni Metro Turnaround project at the end of Howard Street at the Embarcadero has encountered significant quantities of the coal tar residue as have the existing and proposed high-rises on the corner of Howard and Beale. The thickness of the deposits diminishes to near nothing along its fringes and are found at thicknesses up to 7 to 10 feet in the area of Beale and Howard streets. The approximate depth to the top of the deposits is 10 to 12 feet at Beale Street, shallowing to the west and deepening to the east.

In calculating the potential quantities of the contaminated soil, we judged the thickest portion of the material to be 10 feet, diminishing to 0 feet near Fremont and Mission streets giving an average thickness of 5 feet. Although not much field control exists to the north and south of Howard Street, we assumed the zone of contamination extends from 200 feet north of Folsom to 200 feet south of Mission Street, resulting in an 800 foot portion of the alignment being affected. Applying an average thickness of 5 feet results in the following cubic yardage calculation:

$$800' \times 160' \times 5' = 640,000 \text{ cubic feet} / 27 \text{ cf per cy} = 24,000 \text{ cubic yards}$$

Dames & Moore contacted several disposal facilities and found the most favorable price for disposal of the material to be out of state in Utah, where the material would avoid the disposal costs associated with being a California hazardous waste. The estimated cost for transportation, disposal, and taxes for the large quantities estimated was \$85 per cubic yard. The estimated resulting cost is \$2,040,000.

(cont)

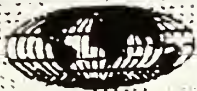
Dames & Moore

September 15, 1995

Page 2

Previous analysis has indicated the material to not be a Federal RCRA hazardous waste. Disposal of the material as either a California State or RCRA hazardous waste could result in significant costs increases up to approximately \$250 per cubic yard. Changes in the classification of the material, availability of out of state facilities, and unit disposal costs between now and the time of disposal could significantly affect these estimates. The actual distribution, extent, and thickness of the contaminated soil is likely hydrogenous and varies considerably in the field. Therefore design and contractor specifications should be structured accordingly. Alternatively, field investigations of actual conditions along the alignment could greatly reduce the error factors in these estimates.

I hope this provides you with the information you require at this time, if you have any questions please contact me at (415) 243-3729.



OFFICE MEMORANDUM

SAN FRANCISCO • OAKLAND • BERKELEY

ACTION	INFO	
To: Richard Moore, ICF Kaiser	Dale Shileikis	Date: August 1, 1995 File: 30752-003-043
From: Mark Filippini, C.E.G. Subject: CalTrain Corridor Study, PNA Soils Evaluation		

Per your request, Dames & Moore had evaluated the presence of Polynuclear Aromatic Hydrocarbons (PNAs) along the proposed alignments within the CalTrain corridor study area. The areas of concern were identified in our preliminary review of known hazardous materials areas which was presented in our June 9, 1995 memorandum and map overlays. That preliminary review identified two areas of concern that were known to contain significant quantities of PNA-containing soil. Those areas were near the intersection of Beale and Howard streets and along Second Street between King and Townsend streets. The sources of the PNA's were coal gasification plants that generated coal tar as a byproduct during the turn of the century. The coal tar was discharged directly into the Bay. The areas of the Bay that received the discharges were later filled as reclaimed land.

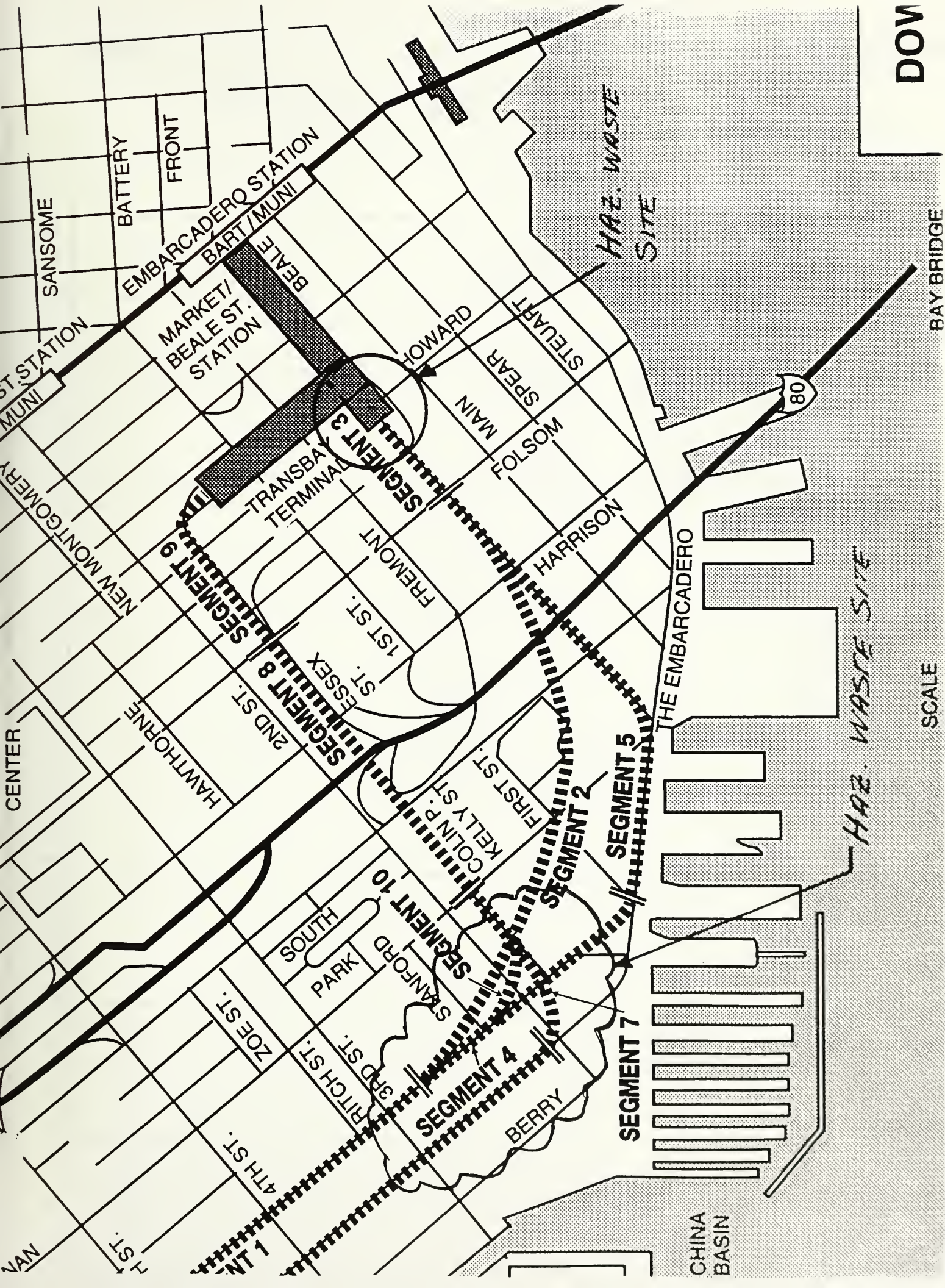
A coal gasification plant existed near Fremont and Howard streets and discharged into Yerba Buena Cove along what is now Howard and Beale streets. Coal tar is known to exist on top of the old Bay Mud deposits along Beale Street from approximately Mission to Folsom streets. It is believed to extend as far west as Fremont Street and as far east as Main Street. The thickness of the deposits diminishes to near nothing along its fringes and are found at thicknesses up to 7 to 10 feet in the area of Beale and Howard streets. The approximate depth to the top of the deposits is 10 to 12 feet at Beale Street, shallowing to the west and deepening to the east.

Additional coal gasification plants existed near Townsend and Second streets and King and Second streets which discharged coal tar into Mission Bay. Discharge deposits from these two plants enjoin and overlap in the area and vary significantly from less than 1 foot to up to 5 feet in thickness with depth ranging from 5 to 10 feet below surface. Deposits were found to diminish quickly along Second Street north of Townsend but extend to the Embarcadero, Mission Creek (China Basin), and Third Street. Recent San Francisco Department of Public Works (SFDPW) activities along the South Embarcadero Roadway from Brannan to Fourth streets encountered spotty deposits of PNA at the 5 to 10 foot depths they were reaching, likely resulting from reworking of the artificial fills in the area after the 1906 earthquake and fire and subsequent building construction. Therefore, quantity estimates for deposits along any alignments in this area would be difficult.

USE #85/CY. SEE 9/15/95 MEMO

Costs for disposal of PNA-containing soil from the SFDPW activities in the area were approximately \$250 per cubic yard including transportation and taxes. Some of the less contaminated soil may be eligible for less costly disposal at Class II disposal facilities, but for the purposes of estimating, the \$250 figure is the most reasonable. Only the soil removed from excavations as required for tunneling will require disposal, but no contaminated soils removed from an excavation can be replaced or reused.

I hope this provides you with the information you require at this time, if you have any questions please contact me at (415) 243-3729.



TITLE _____ JOB NO. 65928-00505
 CLIENT _____ LOCATION _____ DATE 9/17/95
 SUBJECT Hazardous Waste Disposal BY H.W.H.
 SHEET 1 OF 1
 CHECKED BY _____

CODE	DESCRIPTION	QUANTITY	UNIT COST	AMOUNT	TOTAL \$
1					
2	3AC	12 225CY	85 ⁰⁰		1 039 125
3	3AM	12 225CY	85 ⁰⁰		1 039 125
4				USE	1 000 000
5					
6	3BC - Guideway	8 125CY	85 ⁰⁰	690 625	
7	3BC - Station	14 100CY	85 ⁰⁰	1 198 500	
8					1 889 125
9				USE	1 900 000
10	3C	22 225CY	85 ⁰⁰		1 889 125
11				USE	1 900 000
12					
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CALTEACH EXTENSION

DESIGNED BY E. MONE DATE 3/2/94

HAZ. WASTE ENVIRONMENTAL MITIGATION

CHECKED BY _____ DATE _____

REV BCL

9/17/94

FOR SEG. 4.

$$400' \times 40' \times 3' = 48,000 \text{ CF}$$

$$48,000/27 = 1,778 \text{ CY} \left(\frac{.85}{\text{CY}} \right)$$

$$\text{TOTAL FOR SEG 4.} = \$151,000$$

USE \$150,000

FOR SEG 6.

$$100' \times 40' \times 3' = 12,000 \text{ CF}$$

$$12,000/27 = 445 \text{ CY} \left(\frac{.85}{\text{CY}} \right)$$

$$\text{TOTAL FOR SEG 6.} = \$137,800$$

USE 140,000

FOR SEG 7.

$$500' \times 40' \times 3' = 60,000 \text{ CF}$$

$$60,000/27 = 2,222 \text{ CY} \left(\frac{.85}{\text{CY}} \right)$$

$$\text{TOTAL FOR SEG 7} = \$133,000$$

USE \$130,000



9-25-95
By BCC/RLM

**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SEGMENT TRACKWAY & SUBWAY FACTORS**

<u>Segment # 1A</u>	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	0.85	1	1	1	1	0.85
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1.05	1.01	1.03	1	1.09
Cut-And-Cover Rock Bolt	1	1	1	1	1.03	1	1.03
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

<u>Segment # 1B</u>	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	0.85	1	1	1	1	0.85
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1.05	1.01	1.03	1	1.09
Cut-And-Cover Rock Bolt	1	1	1	1	1.03	1	1.03
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

<u>Segment # 2</u>	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1	1	1.05	1	1.03	1	1.08
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

<u>Segment # 3AM</u>	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1.1	1	1.05	1	1.02	1	1.17
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1.75	1	1.05	1	1.03	1	1.83
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03



**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SEGMENT TRACKWAY & SUBWAY FACTORS**

9-25-95
By BCC/RLM

<u>Segment # 3AC</u>	<u>Structure Width Factor</u>	<u>Shoring Wall Ht. Factor</u>	<u>Enviro. Sensitive Factor</u>	<u>Piles Factor</u>	<u>Vent Shaft Factor</u>	<u>Misc. Factor</u>	<u>Total Factor</u>
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1.2	1	1.05	1	1.02	1	1.27
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1.5	1	1.05	1	1.03	1	1.58
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

<u>Segment # 3BM</u>	<u>Structure Width Factor</u>	<u>Shoring Wall Ht. Factor</u>	<u>Enviro. Sensitive Factor</u>	<u>Piles Factor</u>	<u>Vent Shaft Factor</u>	<u>Misc. Factor</u>	<u>Total Factor</u>
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1.2	1	1.05	1	1.03	1	1.28
Cut-And-Cover Rock Bolt	1	1	1.05	1	1.03	1	1.08
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

<u>Segment # 3BC</u>	<u>Structure Width Factor</u>	<u>Shoring Wall Ht. Factor</u>	<u>Enviro. Sensitive Factor</u>	<u>Piles Factor</u>	<u>Vent Shaft Factor</u>	<u>Misc. Factor</u>	<u>Total Factor</u>
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1.2	1	1.05	1	1.03	1	1.28
Cut-And-Cover Rock Bolt	1	1	1.05	1	1.03	1	1.08
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

<u>Segment # 3CM</u>	<u>Structure Width Factor</u>	<u>Shoring Wall Ht. Factor</u>	<u>Enviro. Sensitive Factor</u>	<u>Piles Factor</u>	<u>Vent Shaft Factor</u>	<u>Misc. Factor</u>	<u>Total Factor</u>
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1.2	1	1.05	1	1.03	1	1.28
Cut-And-Cover Rock Bolt	1	1	1.05	1	1.03	1	1.08
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03



9-25-95
By BCC/RLM

**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SEGMENT TRACKWAY & SUBWAY FACTORS**

Segment # 3CC	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1.2	1	1.05	1	1.03	1	1.28
Cut-And-Cover Rock Bolt	1	1	1.05	1	1.03	1	1.08
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 4	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1.08	1	1.03	1	1.11
Cut-And-Cover Rock Bolt	1	1	1.08	1	1.03	1	1.11
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 5	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1.02	1	1.1	1	1.03	0.96	1.11
Cut-And-Cover Rock Bolt	1	1	1	1	1.03	1	1.03
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 6A	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1.12	0.9	1	1	1	0.95	0.97
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1.02	1.01	1.03	0.9	0.96
Cut-And-Cover Rock Bolt	1	1	1	1	1.03	1	1.03
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03



9-25-95
By BCC/RLM

**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SEGMENT TRACKWAY & SUBWAY FACTORS**

Segment # 6B	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1.15	0.9	1	1	1	0.95	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1.07	1	1.02	1.01	1.03	0.9	1.03
Cut-And-Cover Rock Bolt	1	1	1	1	1.03	1	1.03
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 7	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1	1	1.15	1	1.03	1	1.18
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 8	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1	1	1	1	1.03	1	1.03
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 9A	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1	1	1.05	1	1.03	1	1.08
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03



9-25-95
By BCC/RLM

**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SEGMENT TRACKWAY & SUBWAY FACTORS**

Segment # 9B	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1	1	1.05	1	1.03	1	1.08
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 10	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1	1	1.1	1	1.03	1	1.13
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 11	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1	1	1.03	1	1.03
Cut-And-Cover Rock Bolt	1	1	1	1	1.03	1	1.03
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03

Segment # 12	Structure Width Factor	Shoring Wall Ht. Factor	Enviro. Sensitive Factor	Piles Factor	Vent Shaft Factor	Misc. Factor	Total Factor
Trackway At Grade	1	1	1	1	1	1	1
Trackway Retained Cut	1	1	1	1	1	1	1
Cut-And-Cover SPTC 2-trk	1	1	1	1	1.01	1	1.01
Cut-And-Cover SPTC 4-trk	1	1	1	1	1.02	1	1.02
Cut-And-Cover Soil Cement	1	1	1.15	1	1.03	1	1.18
Cut-And-Cover Rock Bolt	1	1	1	1	1.03	1	1.03
Mined Tunnel / Or Special	1	1	1	1	1.03	1	1.03



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SUMMARY OF DEVELOPED TYPICAL TRACKWAY COSTS

9/27/95
BY BCC/RLM

FAC. #	DESCRIPTION	NO. OF TRACKS	RF	TOTAL DOLLARS	COST \$/RF	COMMENTS
200	RAIL TRACKWAY					
243	CUT & COVER, 2 BOX, 2 TRK (SOIL CEMENT WALL)	2	100 RF	\$1,907,062	\$19,071	THROUGHOUT TRACKWAY
244	CUT & COVER, 2 BOX, 2 TRK (ROCK BOLT WALL)	2	100 RF	\$1,718,941	\$17,189	TOWNSEND BETWEEN 1ST & 2ND
245	CUT & COVER, 2 BOX, 2 TRK (SPTC WALL)	2	100 RF	\$3,301,511	\$33,015	ALTERNATIVE 2A, ALONG BEALE STREET
246	CUT & COVER, 2 BOX, 4 TRK (SPTC WALL)	4	100 RF	\$5,250,542	\$52,505	ALTERNATIVE 2A, ALONG BEALE STREET
247	CUT & COVER, 3 BOX, 4 TRK (SPTC WALL)	4	100 RF	\$6,312,151	\$63,122	ALTERNATIVE 2A, ALONG BEALE STREET
248	CUT & COVER, 2 BOX, 2 TRK (ROCK BOLT WALL)	2	100 RF	\$3,015,497	\$30,155	AT MINED TUNNEL PORTAL
251	MINED TUNNEL, DOUBLE TRACK WITH MULT. DRIFTS	2	100 RF	\$2,568,581	\$25,686	ALTERNATIVES 2 & 3 ALONG MINED TUNNEL
256	RETAINED CUT (SOIL CEMENT WALL)	2	100 RF	\$948,262	\$9,483	TOWNSEND BETWEEN 5TH AND 6TH
291	SPECIAL CONSTRUCTION @ BAY BRIDGE ANCHORAGE	4	125RF	\$15,036,215	\$120,290	BAY BRIDGE ANCHORAGE, ALONG BEALE ST.

--- FACIL.STANDARD.WPKG =====	DESCRIPTION =====	QUANTITY =====	MANHOURS =====	LABOR =====	EQUIP USAGE =====	MATERIAL =====	SUB- CONTRACT =====	EQUIP- MENT =====	OH&P =====	TOTAL DOLLARS =====
243	CUT & COVER, 2 BOX, 2 TRK									
243 .0000000.	100' SECTION, UTILIZING	0	0	0	0	0	0	0	0	0
243 .0214100.	SOIL-CEMENT SHORING	200 LF	24	793	164	1059	0	0	489	2505
243 .0214101.	REMOVE ROAD PAVEMENT- 16"THK.	444 SY	111	4243	718	0	0	0	1984	6945
243 .0214220.	TRAFFIC MAINTENANCE (TYP)	100 RF	500	0	0	0	18181	0	909	19090
243 .0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	444 SY	1316	56979	10758	40948	34343	0	32907	175935
243 .0214632.	REMOVE CONCRETE GUIDE WALLS	200 LF	0	0	0	0	18182	0	909	19091
243 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	89 CY	0	0	0	0	5664	0	283	5947
243 .0220228.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	15200 SF	1976	0	0	0	334400	0	16720	351120
243 .0220240.	HAUL TO DUMP DEBRIS	6711 CY	0	0	0	0	67110	0	3356	70466
243 .0220242.	DUMP FEE (CONTAMINATED MATERIAL)	6711 CY	0	0	0	0	80532	0	4027	84559
243 .0220332.	COMPACTED FILL	2222 CY	671	23739	3631	25820	0	0	13530	66720
243 .0221109.	DEWATERING	100 RF	0	0	0	0	36364	0	1818	38182
243 .0221120.	EXCAV MASS-2CY CLAMSHELL	6148 CY	799	31960	16907	0	0	0	19547	68414
243 .0223112.	SITE FILL - IMPORTED	2222 CY	0	0	0	0	15554	0	778	16332
243 .0267250.	INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
243 .0310100.	FORMS - GENERAL	13600 SF	2856	128025	2734	13133	0	0	35973	179865
243 .0313206.	NEOPRENE WATERSTOPS,DB, 6"	300 LF	27	1210	26	1689	0	0	731	3656
243 .0332300.	REBAR - GENERAL	366690 LB	3300	139439	23835	103443	0	0	66679	333596
243 .0334300.	CONCRETE - SLAB ON GRADE	518 CY	259	9693	1598	35970	0	0	11815	59076
243 .0334301.	CONCRETE - WALKWAY	46 CY	92	3360	109	3394	0	0	1716	8579
243 .0344820.	CONCRETE - UPPER SLAB	370 CY	370	13847	2283	25693	0	0	10456	52279
243 .0344821.	CONCRETE - CHAMFER	46 CY	81	3031	497	3394	0	0	1731	8653
243 .0354401.	CONCRETE - INTERIOR WALL	78 CY	137	5127	842	5416	0	0	2846	14231
243 .0354409.	CONCRETE - LOWER WALLS	380 CY	1140	42665	7032	28036	0	0	19433	97166
243 .0511131.	STRUCTURAL STEEL - STRUTS	205 TON	820	35150	6411	88970	0	0	32633	163164
	2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC									
243 .0553110.	WALL HANDRAIL GALV.	200 LF	40	1720	240	2841	0	0	1200	6001
243 .0554140.	METAL WALKWAY 2.5' WIDE (SUBW AY)	200 LF	160	6879	960	3099	0	0	2735	13673
243 .0711030.	RIGIDBOARD PROTECTION	1544 SF	15	493	9	1595	0	0	524	2621
243 .1573201.	WET STANDPIPE	200 TF	0	0	0	0	20000	0	1000	21000
243 .1634200.	LIGHTING (SUBWAY)	200 LF	0	0	0	0	9520	0	476	9996
TOTAL			14,694	508,353	78,754	384,500	647,850	0	287,605	1,907,062

---WORK BREAKDOWN---	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL.STANDARD.WRPKG										
244	CUT & COVER, 2 BOX, 2 TRK									
244	100' SECTION, UTILIZING ROCK BOLT SHORING.	0	0	0	0	0	0	0	0	0
244	SAW CUT ROAD PAVEMENT	200 LF	24	793	164	1059	0	0	489	2505
244	REMOVE ROAD PAVEMENT - 16"THK.	444 SY	111	4243	718	0	0	0	1984	6945
244	TRAFFIC MAINTENANCE (TYP)	100 RF	500	0	0	0	18181	0	909	19090
244	STREET DECKING W/STEEL GIRDER AND TIMBER	444 SY	1316	56979	10758	40948	34343	0	32907	175935
244	REMOVE CONCRETE GUIDE WALLS	200 LF	0	0	0	0	18182	0	909	19091
244	REMOVE TOP OF SOIL CEMENT WALL	89 CY	0	0	0	0	5664	0	283	5947
244	HAUL TO DUMP DEBRIS	6148 CY	0	0	0	0	61480	0	3074	64554
244	DUMP FEE (CONTAMINATED MATERIAL)	6148 CY	0	0	0	0	73776	0	3689	77465
244	COMPACTED FILL	2222 CY	671	23739	3631	25820	0	0	13530	66720
244	DEWATERING	100 RF	0	0	0	0	18182	0	909	19091
244	EXCAV MASS-2CY CLAMSHHELL	6148 CY	799	31960	16907	0	0	0	19547	68414
244	AUGERHOLES, VERTICAL, 24"DIA FOR DEPTH UP TO 75'	2000 LF	0	0	0	0	100000	0	5000	105000
244	SITE FILL - IMPORTED	2222 CY	0	0	0	0	15554	0	778	16332
244	PLACE STEEL PILES - H SECTION WF 14 X 82 LB/LF	2000 LF	750	33489	3342	40926	0	0	18825	96582
244	WIRE MESH AND SHOTCRETE - 6" ROCK BOLTS 30' X 1"	8300 SF	1660	61920	3818	31519	0	0	29447	126704
244	INSTRUMENTATION	80 EA	0	0	0	4340	24000	0	1634	29974
244	FORMS - GENERAL	100 RF	0	0	0	0	8000	0	400	8400
244	NEOPRENE WATERSTOPS,DB, 6"	13600 SF	2856	128025	2734	13133	0	0	35973	179865
244	REBAR - GENERAL	300 LF	27	1210	26	1689	0	0	731	3656
244	CONCRETE - SLAB ON GRADE	366690 LB	3300	139439	23835	103443	0	0	66679	333596
244	CONCRETE - WALKWAY	518 CY	259	9693	1598	35970	0	0	11815	59076
244	CONCRETE - UPPER SLAB	46 CY	92	3360	109	3394	0	0	1716	8579
244	CONCRETE - CHAMFER	370 CY	370	13847	2283	25693	0	0	10456	52279
244	CONCRETE - INTERIOR WALL	46 CY	81	3031	497	3394	0	0	1731	8653
244	CONCRETE - LOWER WALLS	78 CY	137	5127	842	5416	0	0	2846	14231
244	WALL HANDRAIL GALV.	380 CY	1140	42665	7032	28036	0	0	19433	97166
244	METAL WALKWAY 2.5' WIDE (SUBW AY)	200 LF	40	1720	240	2841	0	0	1200	6001
244	RIGIDBOARD PROTECTION	200 LF	160	6879	960	3099	0	0	2735	13673
244	WET STANDPIPE	1544 SF	15	493	9	1595	0	0	524	2621
244	LIGHTING (SUBWAY)	200 TF	0	0	0	0	20000	0	1000	21000
244		200 LF	0	0	0	0	9520	0	476	9996
TOTAL CUT & COVER, 2 BOX, 2 TRK		14,308	568,612	79,503	372,315	406,882	291,629	0	1,718,941	

REPORT D1 - ESTIMATE DETAIL BY FACILITY

---WORK BREAKDOWN---
FACIL.STANDRD.WKPKG

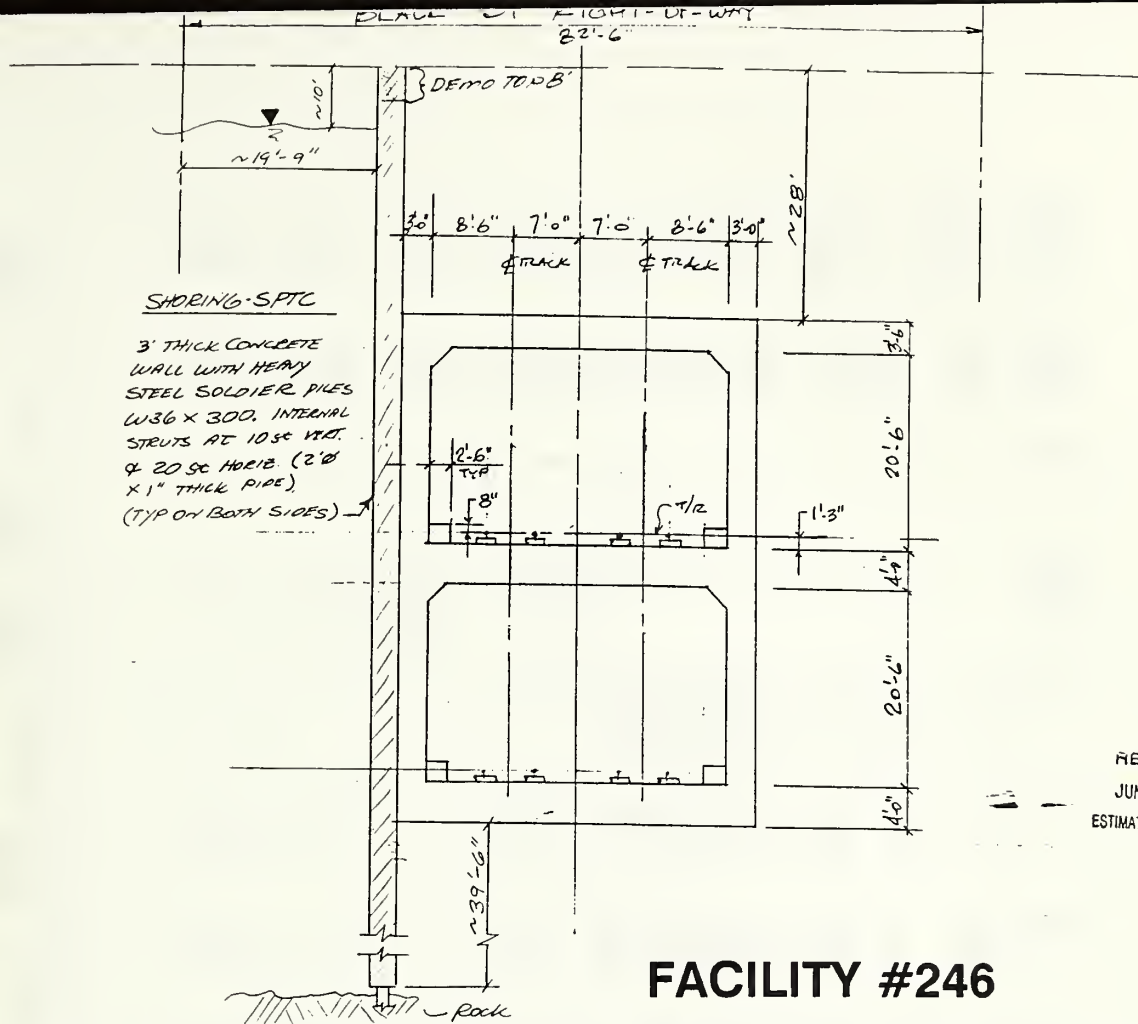
DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
CUT & COVER, 2 BOX, 2 TRK									
100' SECTION, UTILIZING SPIC SHORING.	0	0	0	0	0	0	0	0	0
SAW CUT ROAD PAVEMENT	200 LF	24	793	164	1059	0	0	489	2505
REMOVE ROAD PAVEMENT - 16"THK.	667 SY	167	6383	1079	0	0	0	2985	10447
TRAFFIC MAINTENANCE (TYP)	100 RF	500	0	0	0	18181	0	909	19090
STREET DECKING W/STEEL GIRDER AND TIMBER	444 SY	1316	56979	10758	40948	34343	0	32907	175935
REMOVE TOP OF SLURRY WALL	89 CY	312	11617	1385	0	0	0	5201	18203
REMOVE CONCRETE GUIDE WALLS	200 LF	0	0	0	0	18182	0	909	19091
SLURRY WALL CONSTRUCTION WITH SOLDIER PILES, REINF. CAGE AND TREMIE CONCRETE METHOD	16000 SF	0	0	0	0	1544480	0	77224	1621704
HAUL TO DUMP DEBRIS	7407 CY	0	0	0	0	0	0	3704	77774
DUMP FEE (CONTAMINATED MATERIAL)	7407 CY	0	0	0	0	88884	0	4444	93328
COMPACTED FILL	1926 CY	582	20590	3147	22381	0	0	11733	57851
DEWATERING	100 RF	0	0	0	0	9091	0	455	9546
EXCAV MASS-2CY CLAMSHELL	5629 CY	732	29280	15480	0	0	0	17904	62664
SITE FILL - IMPORTED	1926 CY	0	0	0	0	13482	0	674	14156
INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
FORMS - GENERAL	13600 SF	2856	128025	2734	13133	0	0	35973	179865
NEOPRENE WATERSTOPS, DB, 6"	300 LF	27	1210	26	1689	0	0	731	3656
REBAR - GENERAL	379185 LB	3413	144213	24647	106968	0	0	68957	344785
CONCRETE - SLAB ON GRADE	518 CY	259	9693	1598	35970	0	0	11815	59076
CONCRETE - WALKWAY	46 CY	92	3360	109	3394	0	0	1716	8579
CONCRETE - UPPER SLAB	370 CY	370	13847	2283	25693	0	0	10456	52279
CONCRETE - CHAMFER	46 CY	81	3031	497	3394	0	0	1731	8653
CONCRETE - INTERIOR WALL	76 CY	133	4978	820	5277	0	0	2769	13844
CONCRETE - LOWER WALLS	429 CY	1287	48166	7939	31652	0	0	21939	109696
PATCHING SLURRY WALL INCLUDE CHIPPING AND CLEANING	7900 SF	1185	44402	830	2554	0	0	11947	59733
STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC WALL HANDRAIL GALV.	273 TON	1092	46810	8538	118482	0	0	43458	217288
METAL WALKWAY 2.5' WIDE (SUBW AY)	200 LF	40	1720	240	2841	0	0	1200	6001
RIGIDBOARD PROTECTION	200 LF	160	6879	960	3099	0	0	2735	13673
WET STANDPIPE	1568 SF	16	525	9	1620	0	0	539	2693
LIGHTING (SUBWAY)	0	0	0	0	0	0	0	0	0
	200 TF	0	0	0	0	20000	0	1000	21000
	200 LF	0	0	0	0	9520	0	476	9996

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SAN FRANCISCO, CALIFORNIA
JOB NO. 65928-005-05

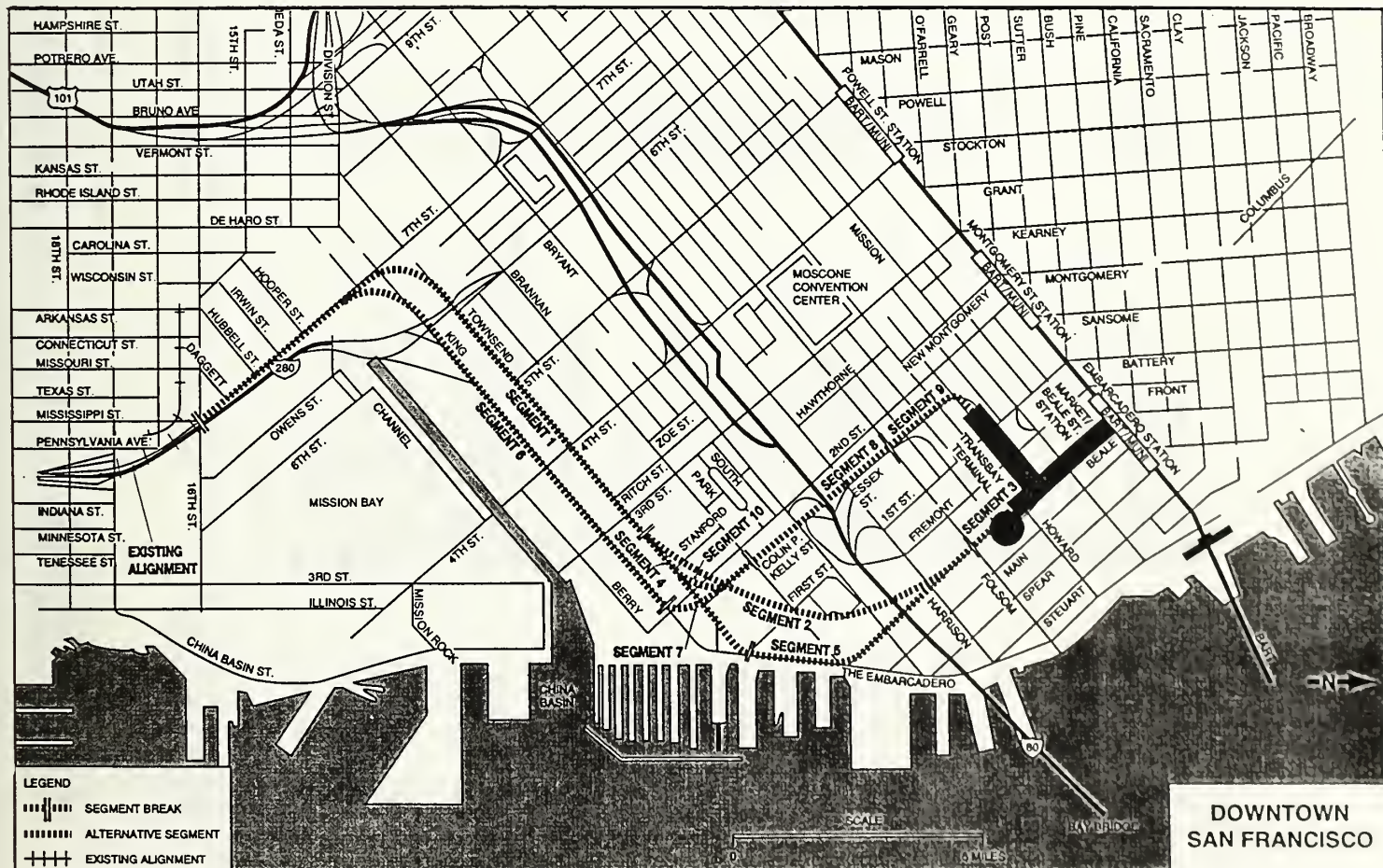
ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
CALTRAIN DOWNTOWN EXTENSION
REPORT D1 - ESTIMATE DETAIL BY FACILITY

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---WORK BREAKDOWN---		DESCRIPTION		QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL-STANDRD.WKPKG												
=====		=====		=====	=====	=====	=====	=====	=====	=====	=====	=====
TOTAL		CUT & COVER, 2 BOX, 2 TRK			14,644	582,501	83,243	420,154	1,838,233	0	377,380	3,301,511



FACILITY #246



--- FACIL.STANDRD.WKPKG =====	DESCRIPTION =====	QUANTITY =====	MANHOURS =====	LABOR =====	EQUIP USAGE =====	MATERIAL =====	SUB- CONTRACT =====	EQUIP- MENT =====	OH&P =====	TOTAL DOLLARS =====
246	CUT & COVER, 2 BOX, 4 TRK									
246	.0000000.	0	0	0	0	0	0	0	0	0
246	100' SECTION, UTILIZING SPTC SHORING.									
246	SAW CUT ROAD PAVEMENT	200 LF	24	793	164	1059	0	0	489	2505
246	REMOVE ROAD PAVEMENT- 16"THK.	667 SY	167	6383	1079	0	0	0	2985	10447
246	TRAFFIC MAINTENANCE (TYP)	100 RF	500	0	0	0	18181	0	909	19090
246	STREET DECKING W/STEEL GIRDER AND TIMBER	411 SY	1218	52736	9958	37904	31791	0	30458	162847
246	REMOVE TOP OF SLURRY WALL	89 CY	312	11617	1385	0	0	0	5201	18203
246	REMOVE CONCRETE GUIDE WALLS	200 LF	0	0	0	0	18182	0	909	19091
246	SLURRY WALL CONSTRUCTION WITH SOLDIER PILES, REINF. CAGE AND TREMIC CONCRETE METHOD	24000 SF	0	0	0	0	2316720	0	115836	2432556
246	HAUL TO DUMP DEBRIS	13493 CY	0	0	0	0	134930	0	6747	141677
246	DUMP FEE (CONTAMINATED MATERIAL)	13493 CY	0	0	0	0	161916	0	8096	170012
246	COMPACTED FILL	3563 CY	1076	38067	5822	41403	0	0	21696	106988
246	DEWATERING	100 RF	0	0	0	0	27273	0	1364	28637
246	EXCAV MASS-2CY CLAMHELL	10826 CY	1407	56280	29772	0	0	0	34421	120473
246	SITE FILL - IMPORTED	3563 CY	0	0	0	0	24941	0	1247	26188
246	INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
246	FORMS - GENERAL	15800 SF	3318	148735	3176	15257	0	0	41792	208960
246	NEOPRENE WATERSTOPS, DB, 6"	400 LF	36	1614	34	2252	0	0	975	4875
246	REBAR - GENERAL	695385 LB	6258	264427	45200	196168	0	0	126449	632244
246	CONCRETE - SLAB ON GRADE	549 CY	275	10292	1693	38123	0	0	12527	62635
246	CONCRETE - WALKWAY	92 CY	184	6721	218	6788	0	0	3432	17159
246	CONCRETE - UPPER SLAB	480 CY	480	17964	2961	33331	0	0	13564	67820
246	CONCRETE - CHAMFER	46 CY	81	3031	497	3394	0	0	1731	8653
246	CONCRETE - SUPPORTED SLAB AND BEAMS	549 CY	549	20546	3387	38123	0	0	15514	77570
246	CONCRETE - LOWER WALLS	1009 CY	3027	113285	18673	74444	0	0	51601	258003
246	PATCHING SLURRY WALL INCLUDE CHIPPING AND CLEANING	16100 SF	2415	90490	1691	5206	0	0	24347	121734
246	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WALERS W36 X 300 & MISC WALL HANDRAIL GALV. METAL WALKWAY 2.5' WIDE (SUBW AY)	525 TON	2100	90019	16418	227850	0	0	83572	417859
246	.0511131.									
246	.0553110.	400 LF	80	3439	480	5681	0	0	2400	12000
246	.0554140.	400 LF	320	13758	1920	6198	0	0	5469	27345
246	.0711030.	2672 SF	27	887	16	2760	0	0	916	4579
246	.1573201.	400 TF	0	0	0	0	40000	0	2000	42000
246	.1634200.	400 LF	0	0	0	0	19040	0	952	19992

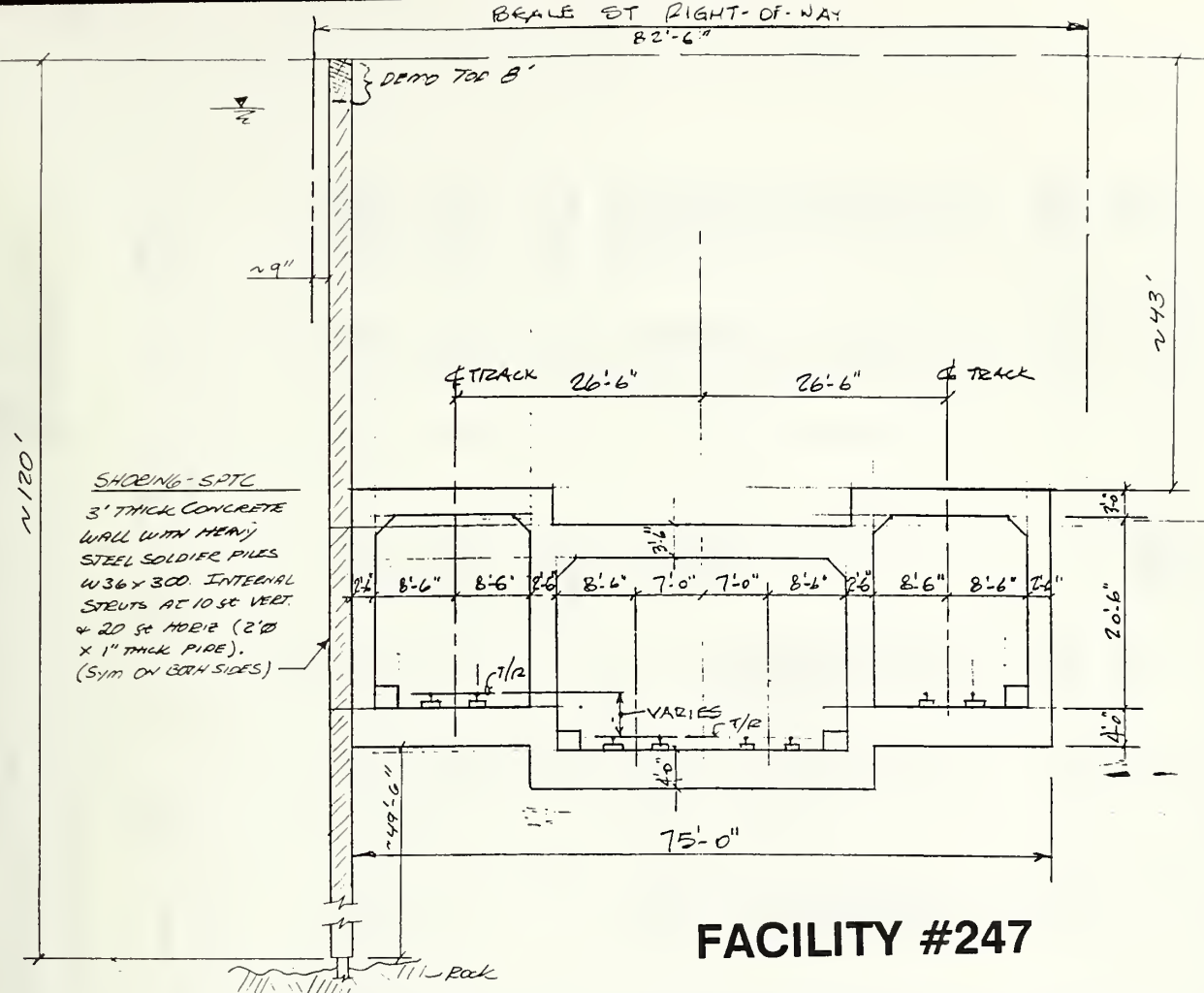
ICF KAISER ENGINEERS, INC.
SAN FRANCISCO, CALIFORNIA
JOB NO. 65928-005-05

ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
CALTRAIN DOWNTOWN EXTENSION
REPORT 01 - ESTIMATE DETAIL BY FACILITY

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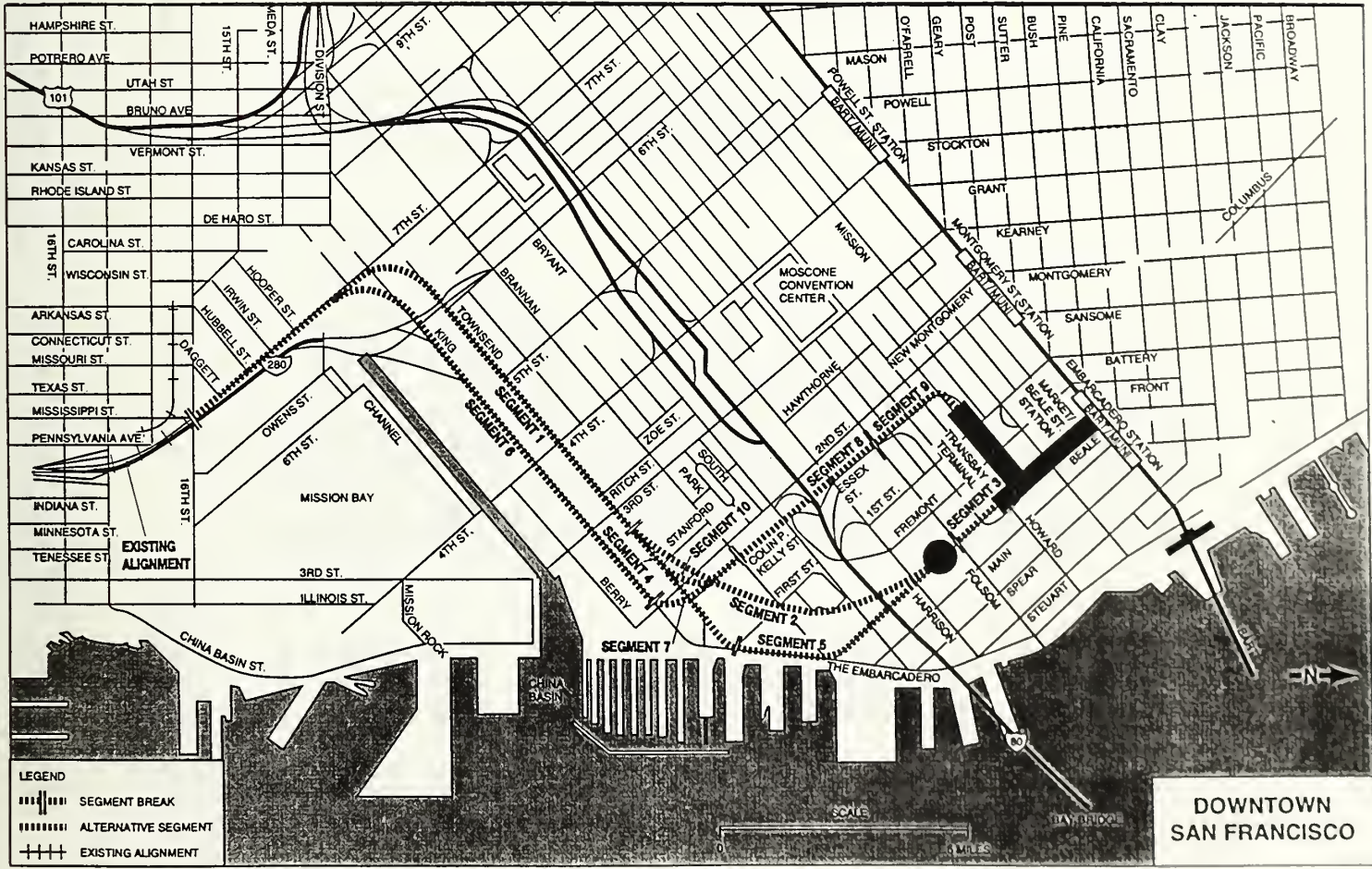
--WORK BREAKDOWN---		DESCRIPTION		QUANTITY		MANHOURS		LABOR		EQUIP USAGE		MATERIAL		SUB- CONTRACT		EQUIP- MENT		OH&P		TOTAL DOLLARS	
FACIL.STANDRD.WKPKG																					
TOTAL		CUT & COVER, 2 BOX, 4 TRK				23,854		951,084		144,544		735,941		2,800,974		0		617,999		5,250,542	

BRAD ST RIGHT-OF-WAY
82'-6"



RECEIVED
JUN 1 1995
ESTIMATING SERVICES

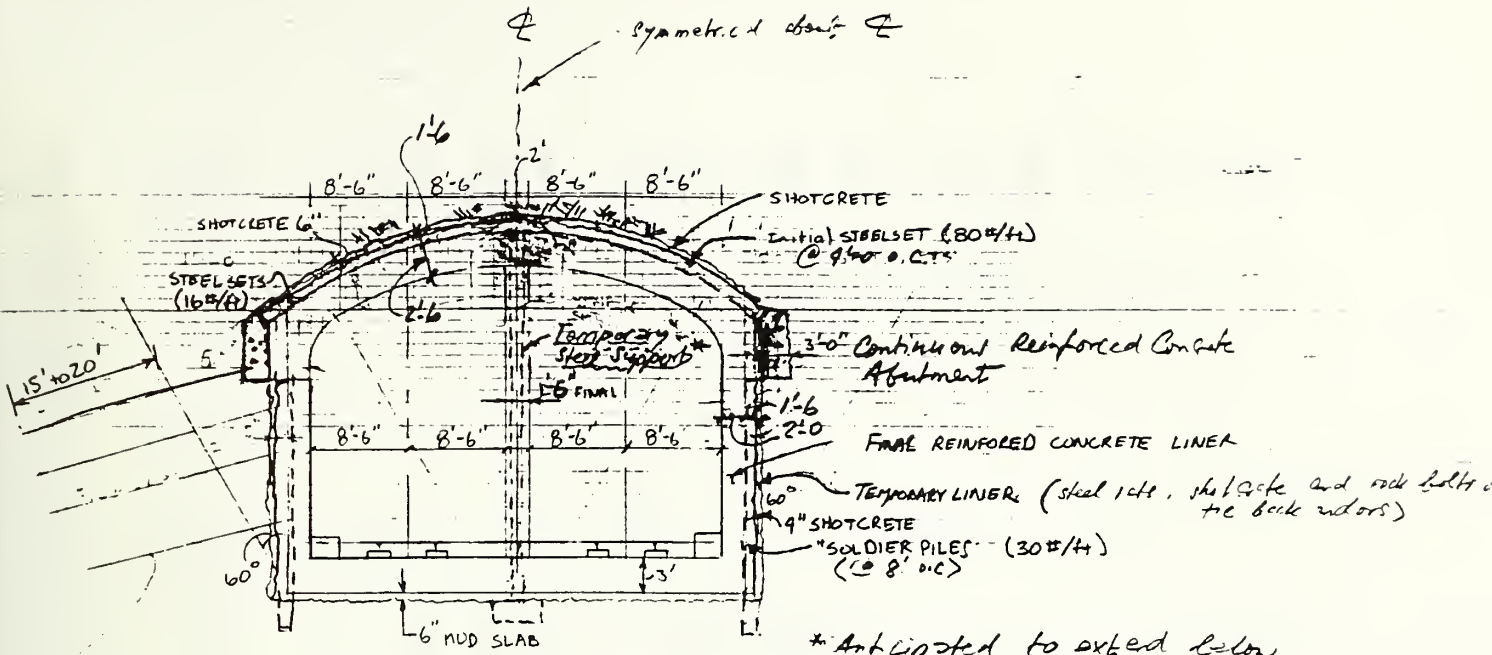
FACILITY #247



DOWNTOWN
SAN FRANCISCO

--- FACIL.STANDARD.WKPKG -----	DESCRIPTION -----	QUANTITY -----	MANHOURS -----	LABOR -----	EQUIP USAGE -----	MATERIAL -----	SUB- CONTRACT -----	EQUIP- MENT -----	OR&P -----	TOTAL DOLLARS -----
247	CUT & COVER, 3 BOX, 4 TRK									
247	100' SECTION, UTILIZING SPTC SHORING.	0	0	0	0	0	0	0	0	0
247	SAV CUT ROAD PAVEMENT	200 LF	24	793	164	1059	0	0	489	2505
247	REMOVE ROAD PAVEMENT- 16"THK.	833 SY	208	7950	1347	0	0	0	3719	13016
247	TRAFFIC MAINTENANCE (TYP)	100 RF	500	0	0	0	18181	0	909	19090
247	STREET DECKING W/STEEL GIRDER AND TIMBER	833 SY	2468	106857	20183	76823	64433	0	61720	330016
247	REMOVE TOP OF SLURRY WALL	89 CY	312	11617	1385	0	0	0	5201	18203
247	REMOVE CONCRETE GUIDE WALLS	200 LF	0	0	0	0	18182	0	909	19091
247	SLURRY WALL CONSTRUCTION WITH SOLDIER PILES, REINF. CAGE AND TREMIE CONCRETE METHOD	24000 SF	0	0	0	0	2316720	0	115836	2432556
247	HAUL TO DUMP DEBRIS	23640 CY	0	0	0	0	236400	0	11820	248220
247	DUMP FEE (CONTAMINATED MATERIAL)	23640 CY	0	0	0	0	283680	0	14184	297864
247	COMPACTED FILL	11945 CY	3607	127611	19518	138805	0	0	72732	358666
247	DEWATERING	100 RF	0	0	0	0	36364	0	1818	38182
247	EXCAV MASS-2CY CLAMSHELL	20973 CY	2726	109040	57676	0	0	0	66866	233402
247	SITE FILL - IMPORTED	11945 CY	0	0	0	0	83615	0	4181	87796
247	INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
247	FORMS - GENERAL	20900 SF	4389	196744	4201	20182	0	0	55282	276409
247	NEOPRENE WATERSTOPS, DB, 6"	400 LF	36	1614	34	2252	0	0	975	4875
247	REBAR - GENERAL	777495 LB	6997	295652	50537	219331	0	0	141380	708900
247	CONCRETE - SLAB ON GRADE	1185 CY	593	22193	3655	82286	0	0	27034	135168
247	CONCRETE - WALKWAY	92 CY	184	6721	218	6788	0	0	3432	17159
247	CONCRETE - UPPER SLAB	891 CY	891	33346	5497	61871	0	0	25179	125893
247	CONCRETE - CHAMFER	123 CY	123	4603	756	5165	0	0	2631	13155
247	CONCRETE - INTERIOR WALL	380 CY	665	24888	4102	26387	0	0	13844	69221
247	CONCRETE - LOWER WALLS	430 CY	1290	48278	7958	31725	0	0	21990	109951
247	PATCHING SLURRY WALL INCLUDE CHIPPING AND CLEANING	4700 SF	705	26416	494	1520	0	0	7108	35538
247	STRUCTURAL STEEL - STRUTS 2" DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC WALL HANDRAIL GALV. METAL WALKWAY 2.5' WIDE (SUBW AY)	762 TON	3048	130656	23830	330708	0	0	121299	606493
247	WHALERS W36 X 300 & MISC	400 LF	80	3439	480	5681	0	0	2400	12000
247	WALL HANDRAIL GALV.	400 LF	320	13758	1920	6198	0	0	5469	27345
247	RIGIDBOARD PROTECTION	1776 SF	18	591	11	1834	0	0	609	3045
247	WET STANDPIPE	400 TF	0	0	0	0	40000	0	2000	42000
247	LIGHTING (SUBWAY)	400 LF	0	0	0	0	19040	0	952	19992
TOTAL		29,184	1,172,767	203,966	3,124,615	1,018,615	0	792,188	6,312,151	

--WORK BREAKDOWN-- FACIL.STANDRD.WKPKG		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
=====		=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
248		CUT & COVER, 2 BOX, 2 TRAK									
248	.0000000.	100' SECTION, UTILIZING ROCK BOLT SHORING.	0	0	0	0	0	0	0	0	0
248	.0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	833 SY	2468	106857	20183	76823	64433	0	61720	330016
248	.0214631.	REMOVE TOP OF SLURRY WALL	89 CY	312	11617	1385	0	0	0	5201	18203
248	.0214632.	REMOVE CONCRETE GUIDE WALLS	200 LF	0	0	0	0	18182	0	909	19091
248	.0220240.	HAUL TO DUMP DEBRIS	14583 CY	0	0	0	0	145830	0	7292	153122
248	.0220242.	DUMP FEE (CONTAMINATED MATERIAL)	14583 CY	0	0	0	0	174996	0	8750	183746
248	.0220332.	COMPACTED FILL	14539 CY	4391	155347	23757	168948	0	0	88536	436588
248	.0221109.	DEWATERING	100 RF	0	0	0	0	27273	0	1364	28637
248	.0221120.	EXCAV MASS-2CY CLAMSHELL	14583 CY	1896	75840	40103	0	0	0	46377	162320
248	.0221252.	AUGERHOLES, VERTICAL, 24"DIA FOR DEPTH UP TO 75'	2417 LF	0	0	0	0	120850	0	6043	126893
248	.0223112.	SITE FILL - IMPORTED	14539 CY	0	0	0	0	101773	0	5089	106862
248	.0232316.	PLACE STEEL PILES - H SECTION WF 14 X 82 LB/LF	2417 LF	906	40455	4039	49459	0	0	22744	116697
248	.0238201.	WIRE MESH AND SHOTCRETE - 6"	10500 SF	2100	78332	4830	39874	0	0	37252	160288
248	.0238202.	ROCK BOLTS 30' X 1"	100 EA	0	0	0	5425	30000	0	2043	37468
248	.0267250.	INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
248	.0310100.	FORMS - GENERAL	17100 SF	3591	160973	3437	16513	0	0	45231	226154
248	.0313206.	NEOPRENE WATERSTOPS,DB, 6"	400 LF	36	1614	34	2252	0	0	975	4875
248	.0332300.	REBAR - GENERAL	520965 LB	4689	198130	33863	146964	0	0	94739	473696
248	.0334300.	CONCRETE - SLAB ON GRADE	652 CY	326	12201	2011	45275	0	0	14872	74359
248	.0334301.	CONCRETE - WALKWAY	46 CY	92	3360	109	3394	0	0	1716	8579
248	.0344820.	CONCRETE - UPPER SLAB	489 CY	489	18301	3017	33956	0	0	13819	69093
248	.0344821.	CONCRETE - CHAMFER	46 CY	81	3031	497	3394	0	0	1731	8653
248	.0354409.	CONCRETE - LOWER WALLS	810 CY	2430	90943	14990	59762	0	0	41424	207119
248	.0553110.	WALL HANDRAIL GALV.	200 LF	40	1720	240	2841	0	0	1200	6001
248	.0554140.	METAL WALKWAY 2.5' WIDE (SUBW AY)	200 LF	160	6879	960	3099	0	0	2735	13673
248	.0711030.	RIGIDBOARD PROTECTION	2328 SF	23	755	14	2405	0	0	794	3968
248	.1573201.	WET STANDPIPE	200 TF	0	0	0	0	20000	0	1000	21000
248	.1634200.	LIGHTING (SUBWAY)	200 LF	0	0	0	0	9520	0	476	9996
TOTAL		CUT & COVER, 2 BOX, 2 TRAK		24,030	966,355	153,469	660,384	720,857	0	514,432	3,015,497



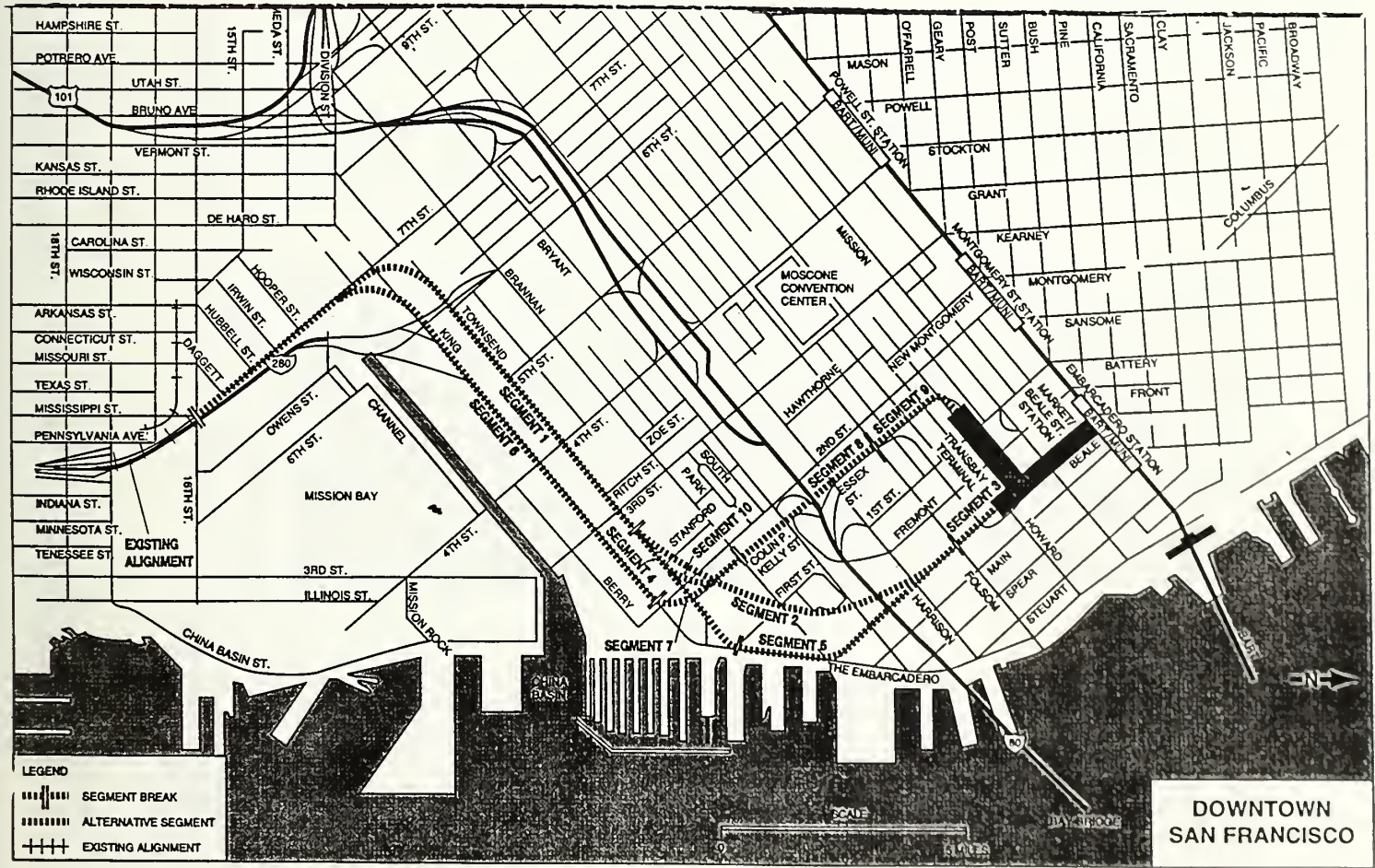
TYPICAL SECTION
TUNNEL ALIGNMENT

- Rock Anchors or Tie Back Anchors.

* Anticipated to extend below drift 3 excavation, only in very poor soil.

ICFKE
7/21/95
REVISED 7/27/95

FACILITY #251



---WORK BREAKDOWN--- FACIL.STANDRD.WPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
251E .0220243.	HAUL OF MATERIAL - CLEAN FILL (INCLUDES DUMP FEE)	1653 CY	0	0	0	0	10331	0	517	10848
251E .0238200.	WIRE MESH AND SHOTCRETE - 6" (MATERIAL COST ONLY)	233 SF	0	0	0	885	0	0	89	974
251E .0238203.	ROCK BOLTS (MATERIAL COST ONLY) 30' X 1"	100 EA	0	0	0	5425	0	0	543	5968
251E .0241006.	TUNNEL EXCAVATION - LOWER BENCH	1653 CY	3471	133634	49590	8968	0	0	74186	266378
251F .0000000.	MINED TUNNEL - DOUBLE TRACK LINER & FINISH - 100'	0	0	0	0	0	0	0	0	0
251F .0221109.	DEWATERING (GENERAL)	100 RF	0	0	0	0	22727	0	1136	23863
251F .0267250.	INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
251F .0313206.	NEOPRENE WATERSTOPS,DB, 6"	400 LF	36	1614	34	2252	0	0	975	4875
251F .0315801.	FORMS - TUNNEL WALLS & CEILING	12600 SF	3780	161706	5670	12030	0	0	44852	224258
251F .0332302.	REBAR - TUNNEL	358785 LB	4664	191609	10764	101213	0	0	75897	379483
251F .0334302.	CONCRETE - WALKWAY (TUNNEL)	46 CY	92	3360	828	3394	0	0	1896	9478
251F .0340560.	LEAN CONCRETE FILL	79 CY	40	1517	371	3600	0	0	1372	6860
251F .0343183.	CONCRETE - TUNNEL INVERT PUMPED, 3000 PSI	439 CY	593	22193	5545	32389	0	0	15032	75159
251F .0344803.	CONCRETE - TUNNEL ROOF PUMPED, 3000 PSI	613 CY	613	22942	11236	42567	0	0	19186	95931
251F .0344804.	CONCRETE - TUNNEL WALLS PUMPED, 3000 PSI	520 CY	910	34057	9532	36109	0	0	19925	99623
251F .0553110.	WALL HANDRAIL GALV.	200 LF	40	1720	240	2841	0	0	1200	6001
251F .0554140.	METAL WALKWAY 2.5' WIDE (SUBW AY)	200 LF	160	6879	960	3099	0	0	2735	13673
251F .0711020.	WATER PROOFING MEMBRANE	7900 SF	395	12972	245	11220	0	0	6109	30546
251F .1510051.	DRAINAGE FOR MINED TUNNEL	100 RF	0	0	0	0	13000	0	650	13650
251F .1573201.	WET STANDPIPE	200 TF	0	0	0	0	20000	0	1000	21000
251F .1634200.	LIGHTING (SUBWAY)	200 LF	0	0	0	0	9520	0	476	9996
TOTAL	MINED TUNNEL TWO TRACK		32,128	1,262,100	211,304	388,705	103,447	0	603,025	2,568,581

---WORK BREAKDOWN---	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL.STANDRD.WKPKG	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
256	"J" GUIDEWAY RETAINED CUT, SLR WALL									
256 .0000000.	100' SECTION, UTILIZING SOIL-CEMENT SHORING.	100	0	0	0	0	0	0	0	0
256 .0214100.	SAW CUT ROAD PAVEMENT	200 LF	24	793	164	1059	0	0	489	2505
256 .0214101.	REMOVE ROAD PAVEMENT - 16"THK.	667 SY	167	6383	1079	0	0	0	2985	10447
256 .0214220.	TRAFFIC MAINTENANCE (TYP)	100 RF	500	0	0	0	18181	0	909	19090
256 .0214632.	REMOVE CONCRETE GUIDE WALLS	200 LF	0	0	0	0	18182	0	909	19091
256 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	89 CY	0	0	0	0	5664	0	283	5947
256 .0220227.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) < 75'	8000 SF	0	0	0	0	144000	0	7200	151200
256 .0220240.	HAUL TO DUMP DEBRIS	3644 CY	0	0	0	0	36440	0	1822	38262
256 .0220242.	DUMP FEE (CONTAMINATED MATERIAL)	3644 CY	0	0	0	0	43728	0	2186	45914
256 .0221109.	DEWATERING	100 RF	0	0	0	0	4545	0	227	4772
256 .0221120.	EXCAV MASS-2CY CLAMHELL	3111 CY	404	16160	8555	0	0	0	9886	34601
256 .0267250.	INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
256 .0310100.	FORMS - GENERAL	4000 SF	840	37654	804	3863	0	0	10580	52901
256 .0313206.	NEOPRENE WATERSTOPS,DB, 6"	200 LF	18	807	17	1126	0	0	488	2438
256 .0332300.	REBAR - GENERAL	233835 LB	2105	88945	15199	65965	0	0	42527	212636
256 .0334300.	CONCRETE - SLAB ON GRADE	545 CY	273	10217	1681	37845	0	0	12436	62179
256 .0334301.	CONCRETE - WALKWAY	46 CY	92	3360	109	3394	0	0	1716	8579
256 .0354409.	CONCRETE - LOWER WALLS	325 CY	975	36489	6014	23979	0	0	16621	83103
256 .0511131.	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WALERS W36 X 300 & MISC	70 TON	280	12003	2189	30380	0	0	11143	55715
256 .0525500.	FENCE - ORNAMENTAL	200 LF	0	0	0	0	72800	0	3640	76440
256 .0525501.	ARCHITECTURAL TREETMENT OF RETAINED CUT WALL.	2000 SF	0	0	0	0	7280	0	364	7644
256 .0525502.	LANDSCAPING FOR RETAINED CUT	100 LF	0	0	0	0	3636	0	182	3818
256 .0553110.	WALL HANDRAIL GALV.	200 LF	40	1720	240	2841	0	0	1200	6001
256 .0554140.	METAL WALKWAY 2.5' WIDE (SUBW AY)	200 LF	160	6879	960	3099	0	0	2735	13673
256 .0711030.	RIGIDBOARD PROTECTION	1120 SF	11	361	7	1157	0	0	381	1906
256 .1573201.	WET STANDPIPE	200 TF	0	0	0	0	20000	0	1000	21000
TOTAL			5,889	221,771	37,018	174,708	382,456	0	132,309	948,262
		"J" GUIDEWAY RETAINED CUT, SLR WALL								

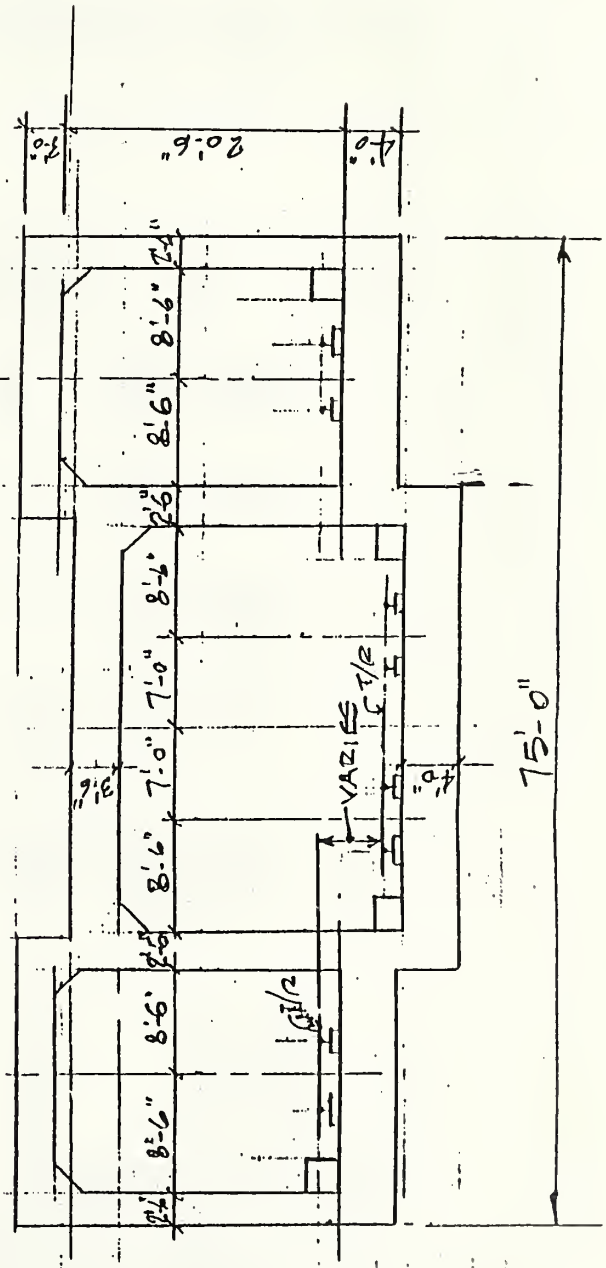
BEALE ST RIGHT-OF-WAY

for Harrison St.
Bridge, typ. both sides

WEST
ANCHORAGE

RECEIVED
SEP 17 1995
ESTIMATING SERVICES

TRACK 26'-6" TRACK 26'-6"



SECTION D
Looking to north

SEGMENT 3AC
FACILITY # 291

REPORT D1 - ESTIMATE DETAIL BY FACILITY

---WORK BREAKDOWN---											
FACIL.STANDRD.WPKPG		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
=====											
291		CUT & COVER @ BAY BRIDGE									
291	.00000001.	4 TRACK/3 CELL - 125' LONG ALTERNATE B - 25' STAGES DAMES & MOORE PLATE 6-27a	1 LS	0	0	0	0	0	0	0	0
291	.0214100.	SAW CUT ROAD PAVEMENT	650 LF	78	2578	532	3441	0	0	1588	8139
291	.0214101.	REMOVE ROAD PAVEMENT - 16"THK.	1120 SY	280	10703	1811	0	0	0	5006	17520
291	.0214221.	TRAFFIC MAINTENANCE	125 RF	0	0	0	0	187500	0	9375	196875
291	.0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	1120 SY	3319	143703	27136	103292	86632	0	82996	443759
291	.0214631.	REMOVE TOP OF SLURRY WALL	225 CY	788	29342	3502	0	0	0	13138	45982
291	.0214632.	REMOVE CONCRETE GUIDE WALLS	500 LF	0	0	0	0	45455	0	2273	47728
291	.0220219.	SLURRY WALL CONSTR W/SOLDIER PILES @ 4', REINF CAGE & TREMIE CONC METH - IN ROCK	17500 SF	0	0	0	0	2625000	0	131250	2756250
291	.0220241.	HAUL TO DUMP - EXCAV MAT'L	21100 CY	2110	78112	85539	0	62773	0	68599	295023
291	.0220242.	DUMP FEE (CONTAMINATED MATERIAL)	21100 CY	0	0	0	0	253200	0	12660	265860
291	.0221110.	DEWATERING	1 LS	0	0	0	0	119000	0	5950	124950
291	.0238202.	ROCK BOLTS 30' X 1"	550 EA	0	0	0	29838	165000	0	11234	206072
291	.0241011.	OPEN ROCK EXCAV W/O POWDER	11100 CY	24975	0	0	0	1931400	0	96570	2027970
291	.0241012.	MINE & MUCK BELOW SLAB	10000 CY	66700	0	0	0	3480000	0	174000	3654000
291	.0267250.	INSTRUMENTATION	125 RF	0	0	0	0	91000	0	4550	95550
291	.0268001.	SITE DRAINAGE	1 LS	0	0	0	0	24000	0	1200	25200
291	.0310100.	FORMS - GENERAL	15200 SF	3192	143087	3055	14678	0	0	40205	201025
291	.0332309.	REBAR - GENERAL	1272450 LB	25449	1073326	184505	358958	0	0	404697	2023486
291	.0340560.	LEAN CONCRETE FILL	11100 CY	5550	210449	52170	505827	0	0	192112	960558
291	.0343299.	UPPER SLAB ON GRADE	2170 CY	2170	0	0	0	229391	0	11470	240861
291	.0343301.	EMBEDDED METAL - PLATFORM	35000 LB	1400	62517	1155	83621	0	0	36823	184116
291	.0344302.	CONCRETE - LOWER PLATFORM	2170 CY	4340	158526	5143	160103	0	0	80943	404715
291	.0354409.	CONCRETE - LOWER WALLS	650 CY	1950	72979	12029	47957	0	0	33241	166206
291	.0511131.	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	765 TON	3060	131170	23924	332010	0	0	121776	608880
291	.1573251.	FIRE PROTECTION	10000 SF	60	0	0	0	10000	0	500	10500
291	.1634200.	LIGHTING (SUBWAY)	500 LF	0	0	0	0	23800	0	1190	24990

REPORT TOTAL

145,421 2,118,492 400,501 1,639,725 9,334,151 0 1,543,346 15,036,215



ICF KAISER

CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SUMMARY OF DEVELOPED TYPICAL RAIL TERMINAL COSTS

10/02/95
BY BCC/RLM

FAC. #	DESCRIPTION	NO. OF TRACKS	RF	TOTAL DOLLARS	COST \$/RF	COMMENTS
300	<u>RAIL TERMINALS</u>					
320	MARKET/BEALE STATION - SIDE PLAT. (SPTC WALL) 2A	4	1080 RF	\$117,070,124	\$108,398	BEALE AND MARKET STACKED
321	MARKET/BEALE STATION - CENTER PLAT. (SPTC WALL) 2A	4	1080 RF	\$115,280,198	\$106,741	BEALE AND MARKET STACKED
322	STAGGERED MARKET/BEALE STATION - CENT PLT. (SOIL CEMENT) 2B	4	1680 RF	\$99,266,160	\$91,913	BEALE AND MARKET STAGGERED
323	MISSION/FOLSOM STATION - CENT PLT. (SOIL CEMENT) 2C	4	1080 RF	\$95,197,273	\$88,146	MISSION FOLSOM TERMINAL
326	TRANSBAY TERMINAL STATION - CENT PLT (SOIL CEMENT) 3B	4	1080 RF	\$82,382,114	\$76,280	TRANSBAY TERMINAL SITE
381	TRANSBAY TERMINAL STATION - CENT PLT - 3A	4	1080 RF	\$60,774,903	\$56,273	TRANSBAY TERMINAL SITE

c:\master\caltrain\sumsht2.wk3

---WORK BREAKDOWN---	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL. STANDRD. WPKG	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
320	SUBWAY STATION - BEALE ST. SIDE PLT									
320	1080' SECTION, UTILIZING SPTC SHORING.	0	0	0	0	0	0	0	0	0
320	SAW CUT ROAD PAVEMENT	2160 LF	259	8560	1769	11434	0	0	5275	27038
320	REMOVE ROAD PAVEMENT - 16"THK.	5280 SY	1320	50455	8538	0	0	0	23597	82590
320	SPECIAL TRAFFIC MAINTENANCE OVER STATION AREA.	1 LS	0	0	0	0	400000	0	20000	420000
320	STREET DECKING W/STEEL GIRDER AND TIMBER	8720 SY	25837	1118668	211277	804202	674492	0	646123	3454762
320	REMOVE TOP OF SLURRY WALL	2050 CY	7175	267165	31904	0	0	0	119628	418697
320	REMOVE CONCRETE GUIDE WALLS	2305 LF	0	0	0	0	209548	0	10477	220025
320	CUT OPENING TO BART, DISPOSE OF MATERIAL, FINISH OPENING	1 LS	1920	0	0	0	100000	0	5000	105000
320	TRANSITION TO BART SLURRY WALL CONSTRUCTION WITH SOLDIER PILES, REINF. CAGE AND TREMIER CONCRETE METHOD	1 LS 276641 SF	2770 0	0 0	0 0	0 0	265000 26704156	0 0	13250 1335208	278250 28039364
320	HAUL TO DUMP DEBRIS DUMP FEE (CONTAMINATED MATERIAL)	238621 CY 238621 CY	0 0	0 0	0 0	0 0	2386210 2863452	0 0	119311 143173	2505521 3006625
320	COMPACTED FILL	20186 CY	6096	215668	32984	234568	0	0	122918	606138
320	DEWATERING	1080 RF	0	0	0	0	392731	0	19637	412368
320	EXCAV MASS-2CY CLAMSHELL	228910 CY	29758	1190320	629503	0	0	0	727929	2547752
320	INSTRUMENTATION	1080 RF	0	0	0	0	172800	0	8640	181440
320	FORMS - GENERAL	289110 SF	60713	2721562	58111	279179	0	0	764713	3823565
320	NEOPRENE WATERSTOPS, DB, 6"	10683 LF	961	43078	919	60134	0	0	26033	130164
320	REBAR - GENERAL	16453110 LB	148078	6256913	1069452	4641422	0	0	2991947	14959734
320	CONCRETE - PLATFORM	15750 CY	7875	287648	9340	1093680	0	0	347667	1738335
320	CONCRETE - UPPER SLAB	8982 CY	8982	336151	55410	623710	0	0	253818	1269089
320	CONCRETE - SUPPORTED SLAB AND BEAMS	18146 CY	18146	679114	111943	1260058	0	0	512779	2563894
320	CONCRETE - EXTERIOR WALLS	21643 CY	37875	1417472	233636	1502890	0	0	788500	3942498
320	JET GROUTING 25' THICK SLAB	1 LS	0	0	0	0	8918180	0	445909	9364089
320	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	7942 TON	31768	1361771	248370	3446828	0	0	1264242	6321211
320	ARCHITECTURAL FINISH - SIDE PLATFORM STATION	1 LS	0	0	0	0	5329000	0	266450	5595450
320	WATER PROOFING MEMBRANE	226984 SF	11349	372701	7037	322377	0	0	175529	877644
320	CONCRETE STAIRS, NOSING & ETC NOSING & ETC. (BETWEEN PLATFORMS)	16 LS	0	0	0	0	352000	0	17600	369600
320	CONCRETE STAIRS, NOSING & ETC NOSING & ETC. (BETWEEN MEZZANINE & STREET)	6 LS	0	0	0	0	156000	0	7800	163800

--WORK BREAKDOWN---									
FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	TOTAL DOLLARS
320 .1510050.	DRAINAGE	1 LS	0	0	0	0	222727	0	233863
320 .1571100.	HVAC	1 LS	0	0	0	0	1000000	0	50000
320 .1571101.	VENTILATION SHAFT, EQUIPMENT & STACK FIREPROTECTION	2 EA	0	0	0	0	4400000	0	220000
320 .1573200.	WET STANDPIPE	1 LS	0	0	0	0	750000	0	37500
320 .1573201.	WET STANDPIPE DELUGE SYSTEM	400 TF	0	0	0	0	40000	0	2000
320 .1573202.	ADJACENT TO TRACKWAY	400 TF	0	0	0	0	40000	0	2000
320 .1574100.	PLUMBING	1 LS	0	0	0	0	800000	0	40000
320 .1575101.	ELEVATOR - STREET LVL TO MEZ. APPROX. 26' (INC. HOISTWAY)	2 EA	0	0	0	0	300000	0	15000
320 .1575102.	ELEVATOR - MEZZANINE DOWN TO LOWER TRACK LEVEL, APPROX 49' (INCLUDING COST OF HOISTWAY)	6 EA	0	0	0	0	1500000	0	75000
320 .1575201.	STREET ENTRANCE	6 EA	0	0	0	0	3000000	0	150000
320 .1575203.	ESCALATORS - REVERSIBLE, 48" WIDE, PLAT. TO PLAT. (PRICE INCLUDES ESC. WAY) -	24 EA	0	0	0	0	3000000	0	150000
320 .1575204.	ESCALATORS - REVERSIBLE, 48" WIDE, MEZ. TO STREET. (PRICE INCLUDES ESC. WAY) -	6 EA	0	0	0	0	810000	0	40500
320 .1575255.	DUCTWORK & HOODS	1768700 LB	70748	0	0	0	5606779	0	280339
320 .1634301.	STATION POWER INCLUDING EMERGENCY GENERATOR	1 LS	0	0	0	0	950000	0	47500
320 .1668001.	UPS - SYSTEM (UNINTERRUPTED POWER SYSTEM)	1 LS	0	0	0	0	100000	0	5000
TOTAL SUBWAY STATION - BEALE ST. SIDE PLT									
		471,630	2,710,193	71,443,075	12,309,128				
		16,327,246	14,280,482		0				117,070,124
REPORT TOTAL									
		471,630	2,710,193	71,443,075	12,309,128				
		16,327,246	14,280,482		0				117,070,124

---WORK BREAKDOWN---
FACIL.STANDRD.WKPKG

DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
SUBWAY STATION - BEALE ST. CENT PLT									
321 .0000000.	0	0	0	0	0	0	0	0	0
321 .0214100.	2160 LF	259	8560	1769	11434	0	0	5275	27038
321 .0214101.	5280 SY	1320	50455	8538	0	0	0	23597	82590
321 .0214220.	1 LS	0	0	0	0	400000	0	20000	420000
321 .0214515.	8920 SY	26430	1144343	216123	822647	689962	0	660949	3534024
321 .0214631.	2052 CY	7182	267426	31935	0	0	0	119744	419105
321 .0214632.	2309 LF	0	0	0	0	209911	0	10496	220407
321 .0214701.	1 LS	1920	0	0	0	100000	0	5000	105000
321 .0214719.	1 LS	2770	0	0	0	265000	0	13250	278250
321 .0220220.	277039 SF	0	0	0	0	26742575	0	1337129	28079704
321 .0220240.	248569 CY	0	0	0	0	2485690	0	124285	2609975
321 .0220242.	248569 CY	0	0	0	0	2982828	0	149141	3131969
321 .0220332.	22299 CY	6734	238239	36437	259122	0	0	135783	669581
321 .0221109.	1080 RF	0	0	0	0	392731	0	19637	412368
321 .0221120.	240086 CY	31211	1248440	660237	0	0	0	763471	2672148
321 .0267250.	1080 RF	0	0	0	0	172800	0	8640	181440
321 .0310100.	301000 SF	63210	2833494	60501	290661	0	0	796164	3980820
321 .0313206.	11012 LF	991	44423	947	61986	0	0	26839	134195
321 .0332300.	16124415 LB	145120	6131925	1048087	4548697	0	0	2932177	14660886
321 .0344301.	14740 CY	7370	269202	8741	1023546	0	0	325372	1626861
321 .0344820.	9212 CY	9212	344759	56829	639681	0	0	260317	1301586
321 .0344830.	18401 CY	18401	688657	113516	1277765	0	0	519985	2599923
321 .0354400.	22640 CY	39620	1482779	244399	1572122	0	0	824825	4124125
321 .0364100.	1 LS	0	0	0	0	8918180	0	445909	9364089
321 .0511131.	8168 TON	32672	1400522	255438	3544912	0	0	1300218	6501090
321 .0515016.	1 LS	0	0	0	0	5343000	0	267150	5610150
321 .0711020.	233096 SF	11655	382750	7226	331058	0	0	180259	901293
321 .0955350.	8 LS	0	0	0	0	176000	0	8800	184800
321 .0955351.	6 LS	0	0	0	0	156000	0	7800	163800

---WORK BREAKDOWN---	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL.STANDRD.WKPKG										
321 .1510050.	DRAINAGE	1 LS	0	0	0	0	222727	0	11136	233863
321 .1571100.	HVAC	1 LS	0	0	0	0	1000000	0	50000	1050000
321 .1571101.	VENTILATION SHAFT, EQUIPMENT & STACK	2 EA	0	0	0	0	4400000	0	220000	4620000
321 .1573200.	FIREPROTECTION	1 LS	0	0	0	0	750000	0	37500	787500
321 .1573201.	WET STANDPIPE	400 TF	0	0	0	0	40000	0	2000	42000
321 .1573202.	WET STANDPIPE DELUGE SYSTEM ADJACENT TO TRACKWAY	400 TF	0	0	0	0	40000	0	2000	42000
321 .1574100.	PLUMBING	1 LS	0	0	0	0	800000	0	40000	840000
321 .1575101.	ELEVATOR - STREET LVL TO MEZ. APPROX. 26' (INC. HOISTWAY)	2 EA	0	0	0	0	300000	0	15000	315000
321 .1575102.	ELEVATOR - MEZZANINE DOWN TO LOWER TRACK LEVEL, APPROX 49' (INCLUDING COST OF HOISTWAY)	3 EA	0	0	0	0	750000	0	37500	787500
321 .1575201.	STREET ENTRANCE	6 EA	0	0	0	0	3000000	0	150000	3150000
321 .1575203.	ESCALATORS - REVERSIBLE, 48" WIDE, PLAT. TO PLAT. (PRICE INCLUDES ESC. WAY) -	12 EA	0	0	0	0	1500000	0	75000	1575000
321 .1575204.	ESCALATORS - REVERSIBLE, 48" WIDE, MEZ. TO STREET. (PRICE INCLUDES ESC. WAY) -	6 EA	0	0	0	0	810000	0	40500	850500
321 .1575255.	DUCTWORK & HOODS	1768700 LB	70748	0	0	0	5606779	0	280339	5887118
321 .1634301.	STATION POWER INCLUDING EMERGENCY GENERATOR	1 LS	0	0	0	0	950000	0	47500	997500
321 .1668001.	UPS - SYSTEM (UNINTERRUPTED POWER SYSTEM)	1 LS	0	0	0	0	100000	0	5000	105000
TOTAL	SUBWAY STATION - BEALE ST. CENT PLT		476,825	16,535,974	2,750,723	69,304,183		12,305,687	0	115,280,198
REPORT TOTAL			476,825	16,535,974	2,750,723	69,304,183		12,305,687	0	115,280,198

---WORK BREAKDOWN---	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL-STANDRD.WKPKG										
322 .1571101.	VENTILATION SHAFT, EQUIPMENT & STACK	2 EA	0	0	0	0	440000	0	22000	462000
322 .1573200.	FIREPROTECTION	1 LS	0	0	0	0	750000	0	37500	787500
322 .1573201.	WET STANDPIPE	400 TF	0	0	0	0	40000	0	2000	42000
322 .1573202.	WET STANDPIPE DELUGE SYSTEM ADJACENT TO TRACKWAY	400 TF	0	0	0	0	40000	0	2000	42000
322 .1574100.	PLUMBING	1 LS	0	0	0	0	800000	0	40000	840000
322 .1575251.	MOVING WALK 48" X 280'	4 EA	4326	0	0	0	2240000	0	112000	2352000
322 .1575255.	DUCTWORK & HOODS	1768700 LB	72870	0	0	0	5606779	0	280339	5887118
322 .1668001.	UPS - SYSTEM (UNINTERRUPTED POWER SYSTEM)	1 LS	0	0	0	0	100000	0	5000	105000

TOTAL 2B - SUBWAY STA - MARKET/BEALE			643,348	20,797,560	4,399,675	15,599,849	45,071,250	13,397,826	0	99,266,160

REPORT TOTAL			643,348	20,797,560	4,399,675	15,599,849	45,071,250	13,397,826	0	99,266,160

---WORK BREAKDOWN---	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL. STANDARD WPKG	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
323	2C - SUBWAY STA - MARKET/BEALE									
323 .0000000.	4 TRACK - CENTER PLATFORM	1 EA	0	0	0	0	0	0	0	0
323 .0214100.	SAW CUT ROAD PAVEMENT	2500 LF	300	9915	2048	13234	0	0	6109	31306
323 .0214105.	REMOVE ROAD & PARKING PAVEMENT	19380 SY	3876	148153	25078	0	0	0	69292	242523
323 .0214220.	TRAFFIC MAINTENANCE (TYP)	1080 RF	5400	0	0	0	196355	0	9818	206173
323 .0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	9700 SY	28741	1244403	235021	894583	750295	0	718743	3843045
323 .0214632.	REMOVE CONCRETE GUIDE WALLS	4800 LF	0	0	0	0	436368	0	21818	458186
323 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	2135 CY	0	0	0	0	135871	0	6794	142665
323 .0214701.	CUT OPENING TO BART, DISPOSE OF MATERIAL, FINISH OPENING	1 LS	1920	0	0	0	100000	0	5000	105000
323 .0214713.	PEDESTRIAN PASSAGE TO BART	630 LF	87261	2186761	476280	1784066	6839910	0	1585619	12872636
323 .0220228.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	264000 SF	34320	0	0	0	5808000	0	290400	6098400
323 .0220241.	HAUL TO DUMP - EXCAV MAT'L	276260 CY	27626	1022715	1119958	0	821874	0	898163	3862710
323 .0220242.	DUMP FEE (CONTAMINATED MATERIAL)	276260 CY	0	0	0	0	3315120	0	165756	3480876
323 .0220332.	COMPACTED FILL	38890 CY	11745	415521	63546	451915	0	0	236818	1167800
323 .0221109.	DEWATERING	1080 RF	0	0	0	0	392731	0	19637	412368
323 .0221120.	EXCAV MASS-2CY CLAMSHELL	305560 CY	39723	1825272	728149	0	0	0	1021368	3574789
323 .0267250.	INSTRUMENTATION	1080 RF	0	0	0	0	86400	0	4320	90720
323 .0310100.	FORMS - GENERAL	414525 SF	87050	3902162	83320	400286	0	0	1096442	5482210
323 .0313206.	NEOPRENE WATERSTOPS,DB, 6"	2000 LF	180	8069	172	11258	0	0	4875	24374
323 .0332300.	REBAR - GENERAL	15117675 LB	136059	5749060	982649	4264696	0	0	2749101	13745506
323 .0344301.	CONCRETE - PLATFORM	26430 CY	13215	482700	15673	1835299	0	0	583418	2917090
323 .0344830.	CONCRETE - SUPPORTED SLAB AND BEAMS	22235 CY	22235	832145	137168	1543998	0	0	628328	3141639
323 .0354400.	CONCRETE - EXTERIOR WALLS	9335 CY	16336	611375	100771	648222	0	0	340092	1700460
323 .0354401.	CONCRETE - INTERIOR WALL	1225 CY	2144	80239	13224	85064	0	0	44632	223159
323 .0364103.	CONCRETE (4000 PSI) - COLUMNS	60 CY	131	4903	807	4166	0	0	2469	12345
323 .0511131.	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	6984 TON	27936	1197508	218411	3031056	0	0	1111744	5558719
323 .0515018.	ALLOWANCE - ARCH FINISHES, ESCALATORS & ELEVATORS	1 LS	0	0	0	0	10600000	0	530000	11130000
323 .0711020.	WATER PROOFING MEMBRANE	233096 SF	11655	382750	7226	331058	0	0	180259	901293
323 .0955351.	CONCRETE STAIRS, NOSING & ETC NOSING & ETC. (BETWEEN MEZZANINE & STREET)	6 LS	0	0	0	0	156000	0	7800	163800
323 .1510050.	DRAINAGE	1 LS	0	0	0	0	222727	0	11136	233863
323 .1571100.	HVAC	1 LS	0	0	0	0	1000000	0	50000	1050000

---WORK BREAKDOWN--- FACIL.STANDRD.WKPKG										TOTAL DOLLARS			
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DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P					
=====										=====			
323 .1571101. VENTILATION SHAFT, EQUIPMENT & STACK	2 EA	0	0	0	0	4400000	0	220000		0	220000	4620000	
323 .1573200. FIREPROTECTION	1 LS	0	0	0	0	750000	0	37500		0	37500	787500	
323 .1573201. WET STANDPIPE	400 TF	0	0	0	0	40000	0	2000		0	2000	42000	
323 .1573202. WET STANDPIPE DELUGE SYSTEM ADJACENT TO TRACKWAY	400 TF	0	0	0	0	40000	0	2000		0	2000	42000	
323 .1574100. PLUMBING	1 LS	0	0	0	0	800000	0	40000		0	40000	840000	
323 .1575255. DUCTWORK & HOODS	1768700 LB	70748	0	0	0	5606779	0	280339		0	280339	5887118	
323 .1668001. UPS - SYSTEM (UNINTERRUPTED POWER SYSTEM)	1 LS	0	0	0	0	100000	0	5000		0	5000	105000	
TOTAL 2C - SUBWAY STA - MARKET/BEALE										628,601	4,209,501	42,598,430	12,986,790
										20,103,651	15,298,901		0
													95,197,273
REPORT TOTAL										628,601	4,209,501	42,598,430	12,986,790
										20,103,651	15,298,901		0
													95,197,273

REPORT D1 - ESTIMATE DETAIL BY FACILITY

Part of Segment 3C

---WORK BREAKDOWN---	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS
FACIL.STANDRD.WKPKG	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
391	BART STA. - PEDESTRIAN PASSAGE									
391 .0000000.	TUNNEL 630' X 36' X 14' HIGH	1 EA	0	0	0	0	0	0	0	0
391 .0214100.	SAW CUT ROAD PAVEMENT	1415 LF	170	5619	1159	7491	0	0	3460	17729
391 .0214101.	REMOVE ROAD PAVEMENT - 16"THK.	3085 SY	771	29470	4988	0	0	0	13783	48241
391 .0214220.	TRAFFIC MAINTENANCE (TYP)	630 RF	3150	0	0	0	114540	0	5727	120267
391 .0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	3085 SY	9141	395779	74746	284514	238625	0	228593	1222257
391 .0214632.	REMOVE CONCRETE GUIDE WALLS	2520 LF	0	0	0	0	229093	0	11455	240548
391 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	1190 CY	0	0	0	0	75732	0	3787	79519
391 .0220228.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	98840 SF	12849	0	0	0	2174480	0	108724	2283204
391 .0220241.	HAUL TO DUMP - EXCAV MAT'L	31200 CY	3120	115502	126485	0	92820	0	101436	436243
391 .0220242.	DUMP FEE (CONTAMINATED MATERIAL)	31200 CY	0	0	0	0	374400	0	18720	393120
391 .0220332.	COMPACTED FILL	12650 CY	3820	135146	20670	146997	0	0	77026	379839
391 .0221111.	DEWATERING	630 RF	1418	0	0	0	126000	0	6300	132300
391 .0221120.	EXCAV MASS-2CY CLAMSHELL	31200 CY	4056	186373	74350	0	0	0	104289	365012
391 .0233813.	14" X 14" PRECAST PILE	2970 LF	624	0	0	0	69201	0	3460	72661
391 .0315801.	FORMS - TUNNEL WALLS & CEILING	45720 SF	13716	586762	20574	43653	0	0	162747	813736
391 .0331300.	FORMS - SLAB ON GRADE	3000 SF	900	40344	861	3873	0	0	11270	56348
391 .0332300.	REBAR - GENERAL	688125 LB	6193	261680	44728	194120	0	0	125132	625660
391 .0334300.	CONCRETE - SLAB ON GRADE	2290 CY	1145	42852	7062	159018	0	0	52233	261165
391 .0344803.	CONCRETE - TUNNEL ROOF PUMPED, 3000 PSI	1895 CY	1895	70920	34735	131589	0	0	59311	296555
391 .0344804.	CONCRETE - TUNNEL WALLS PUMPED, 3000 PSI	1320 CY	2310	86452	24196	91661	0	0	50577	252886
391 .0511131.	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WALERS W36 X 300 & MISC	1340 TON	5360	229762	41906	581560	0	0	213307	1066535
391 .0515020.	STAIR ENCLOSURE W/GALV.METAL FRAME AND PLEXIGLASS ROOF	1800 SF	630	0	0	0	160650	0	8033	168683
391 .0554151.	TEMPERED GLASS RAIL	400 LF	100	0	0	0	50000	0	2500	52500
391 .0554152.	DOORS W/ELECTROMAG HOLDERS	4 EA	16	0	0	0	2800	0	140	2940
391 .0554153.	EMERG SECURITY ROLL-DOWN GATE W/MAN DOOR	504 SF	121	0	0	0	20160	0	1008	21168
391 .0931113.	12" X 12" VIT. PORCELAIN PAVERS	13560 SF	2305	0	0	0	124752	0	6238	130990
391 .0931137.	TUNNEL FACING (STEEL STUDS UNDER ARCH PANEL CLADDING)	18144 SF	2722	0	0	0	217728	0	10886	228614
391 .0941401.	SUSP'D. ACOUSTIC MET. PANELS W/BATTS	22680 SF	2495	0	0	0	224532	0	11227	235759
391 .0955301.	CMU WALL 8" X 8" GLAZED VIT PORCELAIN	3300 SF	429	0	0	0	41250	0	2063	43313

--WORK BREAKDOWN---											
FACIL. STANDRD. WKPKG											
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DESCRIPTION											
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QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS			
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391 .0955355.											
	156 TR	200	0	0	0	26832	0	1342		28174	
391 .1571111.	22680 SF	2722	0	0	0	147420	0	7371		154791	
391 .1573251.	25560 SF	153	0	0	0	25560	0	1278		26838	
391 .1575251.	4 EA	4200	0	0	0	2240000	0	112000		2352000	
391 .1634351.	25560 SF	383	0	0	0	38340	0	1917		40257	
391 .1668011.	1 LS	150	0	0	0	25000	0	1250		26250	

BART STA. - PEDESTRIAN PASSAGE											
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TOTAL											
87,264 2,186,661 476,460 1,644,476 6,839,915 1,528,590 0 12,676,102											

REPORT TOTAL											
87,264 2,186,661 476,460 1,644,476 6,839,915 1,528,590 0 12,676,102											

--WORK BREAKDOWN--
FACIL.STANDRD.WPKG

-----	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P	TOTAL DOLLARS	=====
326	TRANSBAY TERMINAL SUBWAY STATION										
326	SEG 9B, STA 3B -	1 EA	0	0	0	0	0	0	0	0	
	4 TRACK/CENTRAL PLATFORM										
326	SAW CUT ROAD PAVEMENT	280 LF	34	1124	229	1482	0	0	689	3524	
326	REMOVE ROAD & PARKING PAVEMENT	2335 SY	467	17850	3021	0	0	0	8348	29219	
326	TRAFFIC MAINTENANCE (TYP)	1080 RF	5400	0	0	0	196355	0	9818	206173	
326	STREET DECKING W/STEEL GIRDER AND TIMBER	2335 SY	6919	299573	56575	215345	180612	0	173024	925129	
326	REMOVE CONCRETE GUIDE WALLS	4320 LF	0	0	0	0	392731	0	19637	412368	
326	REMOVE TOP OF SOIL CEMENT WALL	2040 CY	0	0	0	0	129826	0	6491	136317	
326	CUT OPENING TO BART, DISPOSE OF MATERIAL, FINISH OPENING	1 LS	1920	0	0	0	100000	0	5000	105000	
326	PEDESTRIAN PASSAGE TO BART	950 LF	131585	3297520	718200	2690258	10314150	0	2391021	19411149	
326	3' THICK SOIL CEMENT WALL WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	162000 SF	21060	0	0	0	3564000	0	178200	3742200	
326	HAUL TO DUMP - EXCAV MAT'L	134900 CY	13490	499400	546885	0	401328	0	438580	1886193	
326	DUMP FEE (CONTAMINATED MATERIAL)	134900 CY	0	0	0	0	1618800	0	80940	1699740	
326	COMPACTED FILL	20400 CY	6161	217967	33334	237055	0	0	124226	612582	
326	DEWATERING	1080 RF	0	0	0	0	392731	0	19637	412368	
326	EXCAV MASS-2CY CLAMSHELL	134900 CY	17537	805825	321467	0	0	0	450917	1578209	
326	14" X 14" PRECAST PILE	57225 LF	12017	0	0	0	1333343	0	66667	1400010	
326	INSTRUMENTATION	1080 RF	0	0	0	0	86400	0	4320	90720	
326	6" CONC PAVING FOR PEDESTRIANS	82000 SF	4428	0	0	0	337840	0	16892	354732	
326	FORMS - GENERAL	243000 SF	51030	2287505	48843	234653	0	0	642750	3213751	
326	NEOPRENE WATERSTOPS,DB, 6"	2000 LF	180	8069	172	11258	0	0	4875	24374	
326	REBAR - GENERAL	11605000 LB	104445	4413237	754325	3273771	0	0	2110333	10551666	
326	CONCRETE - PLATFORM	26430 CY	13215	482700	15673	1835299	0	0	583418	2917090	
326	CONCRETE - SUPPORTED SLAB AND BEAMS	12965 CY	12965	485215	79981	900290	0	0	366372	1831858	
326	CONCRETE - EXTERIOR WALLS	4890 CY	8558	320283	52788	339562	0	0	178158	890791	
326	CONCRETE - INTERIOR WALL	1225 CY	2144	80239	13224	85064	0	0	44632	223159	
326	STRUCTURAL STEEL - STRUTS	3175 TON	12700	544400	99292	1377950	0	0	505411	2527053	
	2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC										
326	CONCOURSE BUILDING	80000 SF	40000	0	0	0	5600000	0	280000	5880000	
326	ALLOWANCE - ARCH FINISHES, ESCALATORS & ELEVATORS	1 LS	0	0	0	0	6492900	0	324645	6817545	
326	WATER PROOFING MEMBRANE	223560 SF	11178	367086	6930	317514	0	0	172883	864413	
326	CONCRETE STAIRS	1 LS	0	0	0	0	26000	0	1300	27300	
326	DRAINAGE	1 LS	0	0	0	0	222727	0	11136	233863	

---WORK BREAKDOWN---									
FACIL.STANDRD.WKPKG									
=====	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	TOTAL DOLLARS
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
326 .1571100.	HVAC	1 LS	0	0	0	0	1000000	0	1050000
326 .1571101.	VENTILATION SHAFT, EQUIPMENT & STACK	2 EA	0	0	0	0	4400000	0	4620000
326 .1573200.	FIREPROTECTION	1 LS	0	0	0	0	750000	0	787500
326 .1573201.	WET STANDPIPE	400 TF	0	0	0	0	40000	0	42000
326 .1573202.	WET STANDPIPE DELUGE SYSTEM ADJACENT TO TRACKWAY	400 TF	0	0	0	0	40000	0	42000
326 .1574100.	PLUMBING	1 LS	0	0	0	0	800000	0	840000
326 .1575255.	DUCTWORK & HOODS	1768700 LB	70748	0	0	0	5606779	0	5887118
326 .1668001.	UPS - SYSTEM (UNINTERRUPTED POWER SYSTEM)	1 LS	0	0	0	0	100000	0	105000
TOTAL TRANSBAY TERMINAL SUBWAY STATION									
		548,181	2,750,939	44,126,522				9,857,159	
		14,127,993	11,519,501					0	82,382,114
REPORT TOTAL									
		548,181	2,750,939	44,126,522				9,857,159	
		14,127,993	11,519,501					0	82,382,114

REPORT D1 - ESTIMATE DETAIL BY FACILITY

--- WORK BREAKDOWN --- FACIL. STANDRD. WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	SUB- MATERIAL	EQUIP- MENT	OH&P	TOTAL DOLLARS
381	TRANSBAY TERMINAL - AERIAL STATION								
381	TRAFFIC MAINTENANCE (TYP)	150 RF	750	0	0	0	0	1364	28636
381	CUT OPENING TO BART, DISPOSE OF MATERIAL, FINISH OPENING	1 LS	1920	0	0	0	0	5000	105000
381	PEDESTRIAN PASSAGE TO BART	950 LF	131585	3297520	718200	2690258	10314150	0	19411149
381	CONCOURSE BUILDING	80000 SF	40000	0	0	0	5600000	0	58800000
381	AERIAL PLATFORM	164000 SF	0	0	0	0	27060000	0	28413000
381	VENTILATION EQUIPMENT	2 EA	0	0	0	0	1000000	0	1050000
381	DUCTWORK & HOODS	1768700 LB	70748	0	0	0	5606779	0	5887118
TOTAL	TRANSBAY TERMINAL - AERIAL STATION		245,003	3,297,520	718,200	49,708,201		4,360,724	60,774,903



10/02/95
BY BCC/RLM

[illegible]



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.

SPECIAL TRACKWORK BY SEGEMENT

10/02/95
BY BCC/RLM

SEGMENT NUMBER	TURNOUTS, DIRECT FIX		TURNOUTS, BALLASTED		CROSSINGS, DIRECT FIX		#10 DSS		BUMPERS		ROAD CROSSING		TOTAL COST
	#	AMOUNT @ \$65,000/EA	#	AMOUNT @ \$50,000/EA	#	AMOUNT @ \$90,000/EA	#	AMOUNT @ \$125,000/EA	#	AMOUNT @ \$5,000/EA	#	AMOUNT @ \$6,000/EA	
5	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
6A	4	\$260,000	0	\$0	1	\$90,000	0	\$0	0	\$0	0	\$0	\$350,000
6B	4	\$260,000	0	\$0	1	\$90,000	0	\$0	0	\$0	0	\$0	\$350,000
7	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
8	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
9A	3	\$195,000	0	\$0	1	\$90,000	1	\$125,000	4	\$20,000	0	\$0	* \$430,000
9B	3	\$195,000	0	\$0	1	\$90,000	1	\$125,000	4	\$20,000	0	\$0	* \$430,000
10	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
11	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
12	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0

* ESTIMATE US\$ \$410,000



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SPECIAL TRACKWORK BY SEGEMENT

10/02/95
BY BCC/RLM

SEGMENT NUMBER	TURNOUTS, DIRECT FIX		TURNOUTS, BALLASTED		CROSSINGS, DIRECT FIX		# 10 DSS		BUMPERS		ROAD CROSSING		TOTAL COST
	#	AMOUNT @ \$65,000/EA	#	AMOUNT @ \$50,000/EA	#	AMOUNT @ \$90,000/EA	#	AMOUNT @ \$125,000/EA	#	AMOUNT @ \$5,000/EA	#	AMOUNT @ \$6,000/EA	
SW1	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
SW2	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
SW3	0	\$0	8	\$400,000	0	\$0	1	\$125,000	8	\$40,000	5	\$30,000	\$595,000
SW4	0	\$0	12	\$600,000	1	\$90,000	0	\$0	6	\$30,000	0	\$0	\$720,000
SW5	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
SW6	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
SW7	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
SW8	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
SW9	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
SW10	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
BUS1	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
BUS2	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
BUS3	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
BUS4	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0
BUS5	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	\$0

CALTRAIN DOWNTOWN EXTENSION			JOB # 65928
			BY H.W.HOBBS
			SEPT. 7, 1995
<u>TRACKWORK SUMMARY</u>		<u>16TH ST. YARD</u>	<u>BAYSHORE YARD</u>
TRACK	TF	12,060	13,974
TURNOUTS	EA	8	14
#10 DS	EA	1	0
ROAD CROSSINGS	EA	5	0
PLATFORM CROSSINGS	EA	8	6
CONC. BUMPING POSTS	EA	8	6



WORK BREAKDOWN FACIL. STANDARD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	INDIRECT + OH&P	TOTAL DOLLARS
1	SEG 1: SF TERMINAL ST TO 16TH ST								
13	TIE- BREAKER SUBSTATION	468	23008	1784	10095	1675	189875	56610	283047
14	OVERHEAD CONTACT SYSTEM (OCS)	5445	284395	17742	487164	29300	2713	205330	1026644
	TOTAL SEG 1: SF TERMINAL ST TO 16TH ST	5,913	307,403	19,526	497,259	30,975	192,588	261,940	1,309,691
2	SEG 2: 16TH ST YARD								
23	TIE- BREAKER SUBSTATION	468	23008	1784	10095	1675	189875	56610	283047
24	OVERHEAD CONTACT SYSTEM (OCS)	6576	343465	21390	340046	61050	16275	195558	977784
	TOTAL SEG 2: 16TH ST YARD	7,044	366,473	23,174	350,141	62,725	206,150	252,168	1,260,831
3	SEG 3: 16TH ST TO SAN JOSE								
31	INCOMING POWER	1348	70407	4391	83725	0	0	39631	198154
32	TRACTION POWER SUBSTATION	5669	283522	21146	96362	6190	2830223	809364	4046807
33	TIE- BREAKER SUBSTATION	2246	112597	8478	48127	4625	1026410	300060	1500297
34	OVERHEAD CONTACT SYSTEM (OCS)	212138	11080061	690484	14341195	632500	0	6686063	33430303
	TOTAL SEG 3: 16TH ST TO SAN JOSE	221,401	11,546,587	724,499	14,569,409	643,315	3,856,633	7,835,118	39,175,561
4	SEG 4: PULLMAN WAY MTN FAC SAN JOSE								
43	TIE- BREAKER SUBSTATION	468	23008	1784	10095	1675	189875	56610	283047
44	OVERHEAD CONTACT SYSTEM (OCS)	13246	691844	43079	704653	35750	21700	374259	1871285
	TOTAL SEG 4: PULLMAN WAY MTN FAC SAN JOSE	13,714	714,852	44,863	714,748	37,425	211,575	430,869	2,154,332
5	SEG 5: SAN JOSE TO GILROY								
51	INCOMING POWER	251	13109	817	15000	0	0	7232	36158
52	TRACTION POWER SUBSTATION	1888	94435	7039	32114	2130	941238	269243	1346199
54	OVERHEAD CONTACT SYSTEM (OCS)	63343	3308432	206170	4303584	336500	2713	2039353	10196752
	TOTAL SEG 5: SAN JOSE TO GILROY	65,482	3,415,976	214,026	4,350,698	338,630	943,951	2,315,828	11,579,109
	REPORT TOTAL	313,554	16,351,291	1,026,088	20,482,255	1,113,070	5,410,897	11,095,923	55,479,524

---WORK BREAKDOWN--- FACIL.STANDRD.WKPKG													
=====													
DESCRIPTION													
=====													
QUANTITY													
=====													
MANHOURS													
=====													
LABOR													
=====													
EQUIP													
=====													
USAGE													
=====													
MATERIAL													
=====													
SUB-CONTRACT													
=====													
EQUIP-MENT													
=====													
INDIRECT + OH&P													
=====													
TOTAL DOLLARS													
=====													
SEG 1: SF TERMINAL ST TO 16TH ST													
TIE- BREAKER SUBSTATION													
13	.0200001.A	SITEWORK/DRAINAGE	1800 SF	10	400	0	156	0	0	139	695		
13	.0271128.A	FENCE, 8' HIGH, CHAIN LINK INCLUDING GATE & BARBED WIRE	175 LF	39	1364	140	1519	0	0	756	3779		
13	.0342002.A	CONCRETE FOUNDATIONS	8 CY	31	1156	232	1042	0	0	608	3038		
13	.1611022.A	SAW CUTTING - ASPHALT 6" THK	100 LF	0	0	0	0	300	0	75	375		
13	.1611036.A	AC PAVING 6" REMOVE/RESTORE	150 SF	0	0	0	0	975	0	244	1219		
13	.1615145.A	6-4" PVC SCH 40 DUCT BANK	80 LF	65	3217	365	1942	0	0	1381	6905		
13	.1631008.A	CONC ENCASED INCL EARTHWORK											
13	.1631008.A	1/C #500MCM XPLE 28KV SHLD	480 LF	29	1515	95	3515	0	0	1281	6406		
13	.1641008.A	COPPER CABLE											
13	.1641008.A	1/C #500 28KV TERMINATION	8 EA	62	3238	200	825	0	0	1066	5329		
13	.1651299.A	INCLUDING HI-POT TESTING											
13	.1651299.A	TIE BREAKER SUBSTATION 25 KV 2-BKRS, BUS PTS, PWR CONT RM BATTERIES & ACCESSORIES	1 EA	176	9193	572	0	0	184450	48554	242769		
13	.1661100.A	SUBSTATION LIGHTING	1800 SF	18	940	58	391	0	0	347	1736		
13	.1663100.A	SUBSTATION GROUNDING	1800 SF	20	1045	65	488	0	0	400	1998		
13	.1677301.A	TESTING/CHECKOUT/ADJUST	16 MH	18	940	57	0	0	0	249	1246		
13	.1677311.A	TRAINING/MANUALS	4 HRS	0	0	0	217	400	0	154	771		
13	.1677321.A	SPARE PARTS	5 \$K	0	0	0	0	0	5425	1356	6781		

TOTAL													
TIE- BREAKER SUBSTATION													
OVERHEAD CONTACT SYSTEM (OCS)													
14	.1611001.B	ALLOWANCE FOR POT-HOLING	3 EA	0	0	0	0	4500	0	1125	5625		
14	.1611003.B	ALLOWANCE FOR REROUTING OF UTILITY INTERFERENCES	3 EA	0	0	0	0	22500	0	5625	28125		
14	.1677051.B	CONTACT WIRE 4/0 AWG COPPER	36940 LF	610	31861	1995	68136	0	0	25498	127490		
14	.1677055.B	MESSENGER WIRE 350MCM COPPER	36940 LF	813	42463	2660	120240	0	0	41341	206704		
14	.1677059.B	RETURN WIRE 4/0 AWG ACSR	36940 LF	610	31861	1995	26453	0	0	15077	75386		
14	.1677129.B	TUNNEL SUPPORT ASSEMBLY - OCS	420 EA	2772	144783	9013	227850	0	0	95412	477058		
14	.1677141.B	CATENARY HANGER 4", BRONZE, INCLUDING 2 - CONNECTORS	420 EA	116	6059	375	9114	0	0	3887	19435		
14	.1677145.B	POTENTIAL EQUALIZING JUMPER	168 EA	83	4335	270	9114	0	0	3430	17149		
14	.1677151.B	25KV DISCONNECT SW ASSEMBLY	1 EA	18	940	57	0	0	2713	928	4638		
14	.1677155.B	SECTION INSULATOR ASSEMBLY	2 EA	35	1828	114	6510	0	0	2113	10565		
14	.1677161.B	CROSS-CONNECT GROUND WIRES & RUNNING RAILS - TUNNEL	14 EA	223	11647	726	9114	700	0	5547	27734		
14	.1677301.B	TESTING/CHECKOUT/ADJUST	150 MH	165	8618	537	0	0	0	2289	11444		
14	.1677311.B	TRAINING/MANUALS	16 HRS	0	0	0	868	1600	0	617	3085		
14	.1677323.B	SPARE PARTS	9 \$K	0	0	0	9765	0	0	2441	12206		

--- WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	INDIRECT + OH&P	TOTAL DOLLARS
=====										
TOTAL	OVERHEAD CONTACT SYSTEM (OCS)		5,445	284,395	17,742	487,164	29,300	2,713	205,330	1,026,644

TOTAL	SEG 1: SF TERMINAL ST TO 16TH ST		5,913	307,403	19,526	497,259	30,975	192,588	261,940	1,309,691
2	SEG 2: 16TH ST YARD									
23	TIE- BREAKER SUBSTATION									
23	SITEWORK/DRAINAGE	1800 SF	10	400	0	156	0	0	139	695
23	FENCE, 8' HIGH, CHAIN LINK INCLUDING GATE & BARBED WIRE	175 LF	39	1364	140	1519	0	0	756	3779
23	CONCRETE FOUNDATIONS	8 CY	31	1156	232	1042	0	0	608	3038
23	SAW CUTTING - ASPHALT 6" THK	100 LF	0	0	0	0	300	0	75	375
23	AC PAVING 6" REMOVE/RESTORE	150 SF	0	0	0	0	975	0	244	1219
23	6-4" PVC SCH 40 DUCT BANK	80 LF	65	3217	365	1942	0	0	1381	6905
23	CONC ENCASED INCL EARTHWORK									
23	1/C #500MCM XPLE 28KV SHLD COPPER CABLE	480 LF	29	1515	95	3515	0	0	1281	6406
23	1/C #500 28KV TERMINATION INCLUDING HI-POT TESTING	8 EA	62	3238	200	825	0	0	1066	5329
23	TIE BREAKER SUBSTATION 25 KV 2-8KRS, BUS PTS, PWR CONT RM BATTERIES & ACCESSORIES	1 EA	176	9193	572	0	0	184450	48554	242769
23	SUBSTATION LIGHTING	1800 SF	18	940	58	391	0	0	347	1736
23	SUBSTATION GROUNDING	1800 SF	20	1045	65	488	0	0	400	1998
23	TESTING/CHECKOUT/ADJUST	16 MH	18	940	57	0	0	0	249	1246
23	TRAINING/MANUALS	4 HRS	0	0	0	217	400	0	154	771
23	SPARE PARTS	5 \$K	0	0	0	0	0	5425	1356	6781

TOTAL	TIE- BREAKER SUBSTATION		468	23,008	1,784	10,095	1,675	189,875	56,610	283,047

24	OVERHEAD CONTACT SYSTEM (OCS)									
24	ALLOWANCE FOR POT-HOLING	6 EA	0	0	0	0	9000	0	2250	11250
24	ALLOWANCE FOR REROUTING OF UTILITY INTERFERENCES	6 EA	0	0	0	0	45000	0	11250	56250
24	CONTACT WIRE 4/0 AWG COPPER	13640 LF	225	11752	737	25159	0	0	9412	47060
24	RETURN WIRE 4/0 AWG AC SR	1400 LF	23	1201	76	1003	0	0	570	2850
24	POLE W10x49x30'	41 EA	1082	56513	3519	53382	0	0	28354	141768
24	POLE W12x53x30'	42 EA	1386	72391	4507	68355	0	0	36313	181566
24	POLE FOUNDATION 3'DIA x 12'D	41 EA	812	42411	2640	26246	0	0	17824	89121
24	POLE FOUNDATION 3.5'DIAx14'D	42 EA	1386	72391	43292	0	0	0	30048	150238
24	DOWN GUY ASSEMBLY	30 EA	132	6894	429	6510	0	0	3458	17291
24	DOWN GUY FOUNDN 3'DIA x 8'D	30 EA	396	20683	1288	13020	0	0	8748	43730

---WORK BREAKDOWN--- FACIL.STANDRD.WKPKG																		
=====																		
DESCRIPTION																		
=====																		
QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	INDIRECT + OH&P	TOTAL DOLLARS										
=====	=====	=====	=====	=====	=====	=====	=====	=====										
HEAD SPAN ASSEMBLY																		
42 EA	554	28936	1803	82026	0	0	28191	140956										
CATENARY POLE GROUNDING																		
17 EA	14	731	46	221	0	0	250	1248										
25KV DISCONNECT SW ASSEMBLY																		
6 EA	106	5536	343	0	16275	5539	27693	26588										
CROSS-CONNECT GROUND WIRES & RUNNING RAILS-OUTSIDE TUNNEL																		
7 EA	185	9663	601	6456	4550	0	5318	26588										
TESTING/CHECKOUT/ADJUST																		
250 MH	275	14363	894	0	0	0	3814	19071										
TRAINING/MANUALS																		
25 HRS	0	0	0	1356	2500	0	964	4820										
SPARE PARTS																		
12 \$K	0	0	0	13020	0	0	3255	16275										

TOTAL OVERHEAD CONTACT SYSTEM (OCS)				6,576	343,465	21,390	340,046	61,050	195,558	16,275	977,784							

TOTAL SEG 2: 16TH ST YARD				7,044	366,473	23,174	350,141	62,725	252,168	206,150	1,260,831							

SEG 3: 16TH ST TO SAN JOSE																		
INCOMING POWER																		
65' WOOD POLE 115KV W/CROSSARM INSULATORS, & HARDWARE				38 EA	836	43665	2718	61845	0	0	27057	135285						
115KV DEAD-END STRUCTURE INCL CROSSARMS, HARDWARE & INSULATORS				3 EA	158	8252	515	11393	0	0	5040	25200						
#4/0 ACSR CONDUCTOR				14600 LF	321	16766	1051	10487	0	0	7076	35380						
TESTING/CHECKOUT/ADJUST				30 MH	33	1724	107	0	0	0	458	2289						

TOTAL INCOMING POWER				1,348	70,407	4,391	83,725	0	39,631	0	198,154							

TRACTION POWER SUBSTATION																		
SITEWORK/DRAINAGE				18000 SF	99	3960	0	1562	0	0	1381	6903						
FENCE, 8' HIGH, CHAIN LINK INCLUDING GATE & BARBED WIRE				960 LF	216	7557	769	8333	0	0	4165	20824						
CONCRETE FOUNDATIONS				109 CY	420	15668	3161	14192	0	0	8255	41276						
SAW CUTTING - ASPHALT 6" THK				360 LF	0	0	0	1080	0	0	270	1350						
AC PAVING 6" REMOVE/RESTORE				540 SF	0	0	0	3510	0	0	878	4388						
3-2" PVC SCH 40 DUCT BANK				150 LF	43	2128	240	1102	0	0	868	4338						
CONC ENCASED INCL EARTHWORK																		
12-4" PVC SCH 40 DUCT BANK				300 LF	455	22516	2548	13797	0	0	9715	48576						
CONC ENCASED INCL EARTHWORK ALLOW FOR BUS SUPPORTS, EQUIP INTERCONN'S & CONTROLS AT EA SUBSTATION				3 EA	99	5171	322	14648	0	0	5035	25176						
1/C #500MCM XPLE 28KV SHLD COPPER CABLE				3840 LF	232	12117	756	28123	0	0	10249	51245						

---WORK BREAKDOWN--- FACIL.STANDRD.WKPKG =====																		
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DESCRIPTION =====																		
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QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	INDIRECT + OH&P	TOTAL DOLLARS =====										
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32	.1641008.A	1/C #500 28KV TERMINATION INCLUDING HI-POT TESTING	48 EA	370	19325	1202	4948	0	0	6369	31844							
32	.1651052.A	115KV SURGE ARRESTER	6 EA	53	2768	172	0	0	13020	3990	19950							
32	.1651201.A	115KV CIRCUIT SWITCHER, 1200A	3 EA	158	8252	515	0	0	146475	38811	194053							
32	.1651284.A	20/25MVA TRANSFORMER, PAD MTD	3 EA	1485	77562	4829	0	0	911400	248448	1242239							
32	.1651288.A	115KV/25KV, OIL-FILLED																
32	.1651288.A	CT/PT CUBICLE FOR UTILITY CO METERING	3 EA	79	4126	258	0	0	27668	8013	40065							
32	.1651291.A	TRACTION PWR SUBSTATION 25 KV W/ BKRS, PTS, FUSED DISC SWS	3 EA	1056	55155	3433	0	0	1448475	376766	1883829							
32	.1651311.A	CONT RM PWR,BATTERIES & MISC																
32	.1651311.A	POWER FACTOR CORRECTION	3 EA	132	6894	429	0	0	48825	14037	70185							
32	.1651321.A	- ALLOWANCE PER SUBSTATION																
32	.1651321.A	HARMONIC FILTERS ALLOW	3 EA	198	10342	644	0	0	195300	51572	257858							
32	.1661100.A	- ALLOWANCE PER SUBSTATION																
32	.1661100.A	SUBSTATION LIGHTING	18000 SF	178	9297	576	3906	0	0	3445	17224							
32	.1663100.A	SUBSTATION GROUNDING	18000 SF	198	10342	648	4883	0	0	3968	19841							
32	.1677301.A	TESTING/CHECKOUT/ADJUST	180 MH	198	10342	644	0	0	2747	13733	17373							
32	.1677311.A	TRAINING/MANUALS	16 HRS	0	0	0	868	1600	0	617	3085							
32	.1677321.A	SPARE PARTS	36 \$K	0	0	0	0	0	39060	9765	48825							

TOTAL TRACTION POWER SUBSTATION																		
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33	TIE- BREAKER SUBSTATION																	
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33	.0200001.A	SITework/DRAINAGE	5400 SF	30	1200	0	469	0	0	417	2086							
33	.0271128.A	FENCE, 8' HIGH, CHAIN LINK	520 LF	117	4093	417	4514	0	0	2256	11280							
33	INCLUDING GATE & BARBED WIRE																	
33	.0342002.A	CONCRETE FOUNDATIONS	23 CY	89	3320	667	2995	0	0	1746	8728							
33	.1611022.A	SAW CUTTING - ASPHALT 6" THK	300 LF	0	0	0	0	900	0	225	1125							
33	.1611036.A	AC PAVING 6" REMOVE/RESTORE	450 SF	0	0	0	0	2925	0	731	3656							
33	.1615149.A	12-4" PVC SCH 40 DUCT BANK	240 LF	364	18013	2038	11038	0	0	7772	38861							
33	CONC ENCASED INCL EARTHWORK																	
33	.1631008.A	1/C #500MCM XPLE 28KV SHLD	2880 LF	174	9088	567	21092	0	0	7687	38434							
33	COPPER CABLE																	
33	.1641008.A	1/C #500 28KV TERMINATION	48 EA	370	19325	1202	4948	0	0	6369	31844							
33	INCLUDING HI-POT TESTING																	
33	.1651298.A	TIE BREAKER SUBSTATION 25 KV	3 EA	924	48261	3005	0	0	1009050	265079	1325395							
33	5-BKRS, BUS PTS, PWR CONT RM																	
33	BATTERIES & ACCESSORIES																	
33	.1661100.A	SUBSTATION LIGHTING	5400 SF	53	2768	173	1172	0	0	1028	5141							
33	.1663100.A	SUBSTATION GROUNDING	5400 SF	59	3082	194	1465	0	0	1185	5926							
33	.1677301.A	TESTING/CHECKOUT/ADJUST	60 MH	66	3447	215	0	0	0	916	4578							
33	.1677311.A	TRAINING/MANUALS	8 HRS	0	0	0	434	800	0	309	1543							
33	.1677321.A	SPARE PARTS	16 \$K	0	0	0	0	0	17360	4340	21700							

---WORK BREAKDOWN--- FACIL.STANDRD.WKPKG																
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DESCRIPTION																
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QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	INDIRECT + OH&P	TOTAL DOLLARS								
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TIE- BREAKER SUBSTATION									2,246	112,597	8,478	48,127	4,625	1,026,410	300,060	1,500,297
OVERHEAD CONTACT SYSTEM (OCS)																
34	.1611001.B	ALLOWANCE FOR POT-HOLING	52 EA	0	0	0	0	78000	0	19500	0	97500	487500			
34	.1611003.B	ALLOWANCE FOR REROUTING OF UTILITY INTERFERENCES	52 EA	0	0	0	0	390000	0	97500	0	97500	487500			
34	.1677051.B	CONTRACT WIRE 4/0 AWG COPPER	616810 LF	10177	531549	33308	1137706	0	0	425641	0	2128204	2128204			
34	.1677055.B	MESSENGER WIRE 350MCM COPPER	616810 LF	13570	708767	44410	2007717	0	0	690224	0	3451118	3451118			
34	.1677059.B	RETURN WIRE 4/0 AWG ACSR	616810 LF	10177	531549	33308	441698	0	0	251639	0	1258194	1258194			
34	.1677101.B	POLE W8X31X30'	1434 EA	25238	1318192	82062	1166918	0	0	641793	0	3208965	3208965			
34	.1677103.B	POLE W10X39X30'	637 EA	13313	695344	43288	656588	0	0	348805	0	1744025	1744025			
34	.1677105.B	POLE W10X49X30'	637 EA	16817	878359	54679	829374	0	0	440603	0	2203015	2203015			
34	.1677107.B	POLE W12X53X30'	478 EA	15774	823883	51289	777945	0	0	413279	0	2066396	2066396			
34	.1677111.B	POLE FOUNDATION 3'DIA x 8'D	1434 EA	18929	988670	61547	622356	0	0	418143	0	2090716	2090716			
34	.1677113.B	POLE FOUNDATION 3'DIA x 10'D	10511	548994	34175	338661	34175	0	0	230458	0	1152288	1152288			
34	.1677115.B	POLE FOUNDATION 3'DIA x 12'D	637 EA	12613	658783	41010	407776	0	0	276892	0	1384461	1384461			
34	.1677117.B	POLE FOUNDATION 3.5'DIAx14'D	478 EA	15774	823883	51289	492699	0	0	341968	0	1709839	1709839			
34	.1677121.B	DOWN GUY ASSEMBLY	448 EA	1971	102946	6410	97216	0	0	51643	0	258215	258215			
34	.1677123.B	DOWN GUY FOUND 3'DIA x 8'D	448 EA	5914	308891	19228	194432	0	0	130638	0	653189	653189			
34	.1677125.B	CANTILEVER ARM PUSH-OFF COMPLETE ASSEMBLY (MEDIUM)	2175 EA	14355	749768	46676	1415925	0	0	553092	0	2765461	2765461			
34	.1677127.B	CANTILEVER ARM PULL-OFF COMPLETE ASSEMBLY (HEAVY)	1170 EA	7722	403323	25108	1142505	0	0	392734	0	1963670	1963670			
34	.1677131.B	COUNTERWEIGHT ARRANGEMENT - AUTO-TENSIONED ASSEMBLY	224 EA	5914	308891	19228	1579760	0	0	476970	0	2384849	2384849			
34	.1677135.B	SIMPLE CATENARY TERMINATION ASSEMBLY, AUTO-TENSIONED	224 EA	1478	77197	4807	243040	0	0	81261	0	406305	406305			
34	.1677137.B	MID-POINT ANCHOR ASSEMBLY AUTO-TENSIONED	112 EA	986	51499	3205	145824	0	0	50132	0	250660	250660			
34	.1677141.B	CATENARY HANGER 4', BRONZE, INCLUDING 2 - CONNECTORS	3186 EA	876	45754	2848	69136	0	0	29435	0	147173	147173			
34	.1677145.B	POTENTIAL EQUALIZING JUMPER	2804 EA	1388	72496	4512	152117	0	0	57281	0	286406	286406			
34	.1677147.B	FULL FEED JUMPER SET	110 EA	182	9506	590	13129	0	0	5806	0	29031	29031			
34	.1677149.B	CATENARY POLE GROUNDING	638 EA	526	27473	1711	8307	0	0	9373	0	46864	46864			
34	.1677155.B	SECTION INSULATOR ASSEMBLY	12 EA	211	11021	687	39060	0	0	12692	0	63460	63460			
34	.1677159.B	CROSS-CONNECT GROUND WIRES & RUNNING RAILS-OUTSIDE TUNNEL	230 EA	6072	317143	19743	212118	149500	0	174626	0	873130	873130			
34	.1677301.B	TESTING/CHECKOUT/ADJUST	1500 MH	1650	86180	5366	0	0	22887	0	114433	114433				
34	.1677311.B	TRAINING/MANUALS	150 HRS	0	0	0	8138	15000	0	5785	0	28923	28923			
34	.1677323.B	SPARE PARTS	130 \$K	0	0	0	141050	0	0	35263	0	176313	176313			

---WORK BREAKDOWN--- FACIL.STANDRD.WKPKG =====										
	DESCRIPTION =====	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	INDIRECT + OH&P	TOTAL DOLLARS =====
	OVERHEAD CONTACT SYSTEM (OCS)		212,138	11,080,061	690,484	14,341,195	632,500	0	6,686,063	33,430,303
	TOTAL		221,401	11,546,587	724,499	14,569,409	643,315	0	7,835,118	39,175,561
4	SEG 3: 16TH ST TO SAN JOSE		221,401	11,546,587	724,499	14,569,409	643,315	0	7,835,118	39,175,561
43	TIE- BREAKER SUBSTATION									
43	SITEWORK/DRAINAGE	1800 SF	10	400	0	156	0	0	139	695
43	FENCE, 8' HIGH, CHAIN LINK	175 LF	39	1364	140	1519	0	0	756	3779
43	INCLUDING GATE & BARBED WIRE									
43	CONCRETE FOUNDATIONS	8 CY	31	1156	232	1042	0	0	608	3038
43	SAN CUTTING - ASPHALT 6" THK	100 LF	0	0	0	0	300	0	75	375
43	AC PAVING 6" REMOVE/RESTORE	150 SF	0	0	0	0	975	0	244	1219
43	6-4" PVC SCH 40 DUCT BANK	80 LF	65	3217	365	1942	0	0	1381	6905
43	CONC ENCASED INCL EARTHWORK									
43	1/C #500MCM XPLE 28KV SHLD	480 LF	29	1515	95	3515	0	0	1281	6406
43	COPPER CABLE									
43	1/C #500 28KV TERMINATION	8 EA	62	3238	200	825	0	0	1066	5329
43	INCLUDING HI-POT TESTING									
43	TIE BREAKER SUBSTATION 25 KV	1 EA	176	9193	572	0	0	184450	48554	242769
43	2-BKRS, BUS PTS, PWR CONT RM									
43	BATTERIES & ACCESSORIES									
43	SUBSTATION LIGHTING	1800 SF	18	940	58	391	0	0	347	1736
43	SUBSTATION GROUNDING	1800 SF	20	1045	65	488	0	0	400	1958
43	TESTING/CHECKOUT/ADJUST	16 MH	18	940	57	0	0	0	249	1246
43	TRAINING/MANUALS	4 HRS	0	0	0	217	400	0	154	771
43	SPARE PARTS	5 \$K	0	0	0	0	0	5425	1356	6781
	TOTAL		468	23,008	1,784	10,095	1,675	189,875	56,610	283,047
44	TIE- BREAKER SUBSTATION									
44	OVERHEAD CONTACT SYSTEM (OCS)									
44	ALLOWANCE FOR POT-HOLING	3 EA	0	0	0	0	4500	0	1125	5625
44	ALLOWANCE FOR REROUTING OF UTILITY INTERFERENCES	3 EA	0	0	0	0	22500	0	5625	28125
44	CONTACT WIRE 4/0 AWG COPPER	29040 LF	479	25018	1568	53564	0	0	20038	100188
44	RETURN WIRE 4/0 AWG ACSR	3000 LF	50	2612	162	2148	0	0	1231	6153
44	POLE W10x49x30'	88 EA	2323	121331	7554	114576	0	0	60865	304326
44	POLE W12x53x30'	88 EA	2904	151677	9442	143220	0	0	76085	380424
44	POLE FOUNDATION 3'DIA x 12'D	88 EA	1742	90985	5665	56333	0	0	38246	191229
44	POLE FOUNDATION 3.5'DIAx14'D	88 EA	2904	151677	9442	90706	0	0	62956	314781
44	DOWN GUY ASSEMBLY	60 EA	264	13789	858	13020	0	0	6917	34584
44	DOWN GUY FOUNDN 3'DIA x 8'D	60 EA	792	41367	2575	26040	0	0	17496	87478
44	HEAD SPAN ASSEMBLY	88 EA	1162	60692	3777	171864	0	0	59083	295416

--- FACIL.STANDRD.WKPKG =====	DESCRIPTION =====	QUANTITY =====	MANHOURS =====	LABOR =====	EQUIP USAGE =====	SUB- CONTRACT =====	EQUIP- MENT =====	INDIRECT + OH&P =====	TOTAL DOLLARS =====
44 .1677149.B	CATENARY POLE GROUNDING	36 EA	30	1567	97	0	0	533	2666
44 .1677151.B	25KV DISCONNECT SW ASSEMBLY	8 EA	141	7364	458	0	21700	7381	36903
44 .1677159.B	CROSS-CONNECT GROUND WIRES & RUNNING RAILS-OUTSIDE TUNNEL	11 EA	290	15147	944	7150	0	8347	41733
44 .1677301.B	TESTING/CHECKOUT/ADJUST	150 MH	165	8618	537	0	0	2289	11444
44 .1677311.B	TRAINING/MANUALS	16 HRS	0	0	0	1600	0	617	3085
44 .1677323.B	SPARE PARTS	20 \$K	0	0	0	0	0	5425	27125
TOTAL OVERHEAD CONTACT SYSTEM (OCS)		13,246		691,844	43,079	35,750	21,700	374,259	1,871,285

TOTAL SEG 4: PULLMAN WAY MTN FAC SAN JOSE		13,714		714,852	44,863	37,425	211,575	430,869	2,154,332

5	SEG 5: SAN JOSE TO GILROY								
51	INCOMING POWER								
51 .1613009.A	65'WOOD POLE 115KV W/CROSSARM INSULATORS, & HARDWARE	6 EA	132	6894	429	0	0	4272	21360
51 .1613025.A	115KV DEAD-END STRUCTURE INCL CROSSARMS, HARDWARE & INSULATORS	1 EA	53	2768	172	0	0	1685	8423
51 .1613108.A	#4/0 ACSR CONDUCTOR	2000 LF	44	2298	144	0	0	970	4849
51 .1677301.A	TESTING/CHECKOUT/ADJUST	20 MH	22	1149	72	0	0	305	1526
TOTAL INCOMING POWER		251		13,109	817	0	0	7,232	36,158

52	TRACTION POWER SUBSTATION								
52 .0200001.A	SITework/DRAINAGE	6000 SF	33	1320	0	0	0	460	2301
52 .0271128.A	FENCE, 8' HIGH, CHAIN LINK INCLUDING GATE & BARBED WIRE	320 LF	72	2519	256	0	0	1388	6941
52 .0342002.A	CONCRETE FOUNDATIONS	36 CY	139	5185	1044	0	0	2729	13645
52 .1611022.A	SAW CUTTING - ASPHALT 6" THK	120 LF	0	0	0	360	0	90	450
52 .1611036.A	AC PAVING 6" REMOVE/RESTORE	180 SF	0	0	0	1170	0	293	1463
52 .1615102.A	3-2" PVC SCH 40 DUCT BANK CONC ENCASED INCL EARTHWORK	50 LF	14	693	80	367	0	285	1425
52 .1615149.A	12-4" PVC SCH 40 DUCT BANK CONC ENCASED INCL EARTHWORK	100 LF	152	7522	849	4599	0	3243	16213
52 .1622400.A	ALLOW FOR BUS SUPPORTS, EQUIP INTERCONN'S & CONTROLS AT EA SUBSTATION	1 EA	33	1724	107	4883	0	1679	8393
52 .1631008.A	1/C #500MCH XPLE 28KV SHLD COPPER CABLE	1280 LF	77	4022	252	9374	0	3412	17060
52 .1641008.A	1/C #500 28KV TERMINATION INCLUDING HI-POT TESTING	16 EA	123	6424	401	1649	0	2119	10593

---WORK BREAKDOWN--- FACIL.STANDRD.WKPKG										=====									
DESCRIPTION										QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	INDIRECT + OH&P	TOTAL DOLLARS	
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---WORK BREAKDOWN--- FACIL.STANDRD.WKPKG =====											
DESCRIPTION =====											
QUANTITY MANHOURS LABOR EQUIP SUB- EQUIP- INDIRECT TOTAL =====											
MATERIAL CONTRACT MENT + OH&P DOLLARS =====											
54	.1677135.B	SIMPLE CATENARY TERMINATION ASSEMBLY, AUTO-TENSIONED	68 EA	449	23451	1459	73780	0	0	24673	123363
54	.1677137.B	MID-POINT ANCHOR ASSEMBLY AUTO-TENSIONED	34 EA	299	15617	973	44268	0	0	15215	76073
54	.1677141.B	CATENARY HANGER 4", BRONZE, INCLUDING 2 - CONNECTORS	954 EA	262	13684	853	20702	0	0	8810	44049
54	.1677145.B	POTENTIAL EQUALIZING JUMPER	840 EA	416	21728	1352	45570	0	0	17163	85813
54	.1677147.B	FULL FEED JUMPER SET	34 EA	56	2925	182	4058	0	0	1791	8956
54	.1677149.B	CATENARY POLE GROUNDING	191 EA	158	8252	512	2487	0	0	2813	14064
54	.1677151.B	25KV DISCONNECT SW ASSEMBLY	1 EA	18	940	57	0	2713	928	4638	
54	.1677155.B	SECTION INSULATOR ASSEMBLY	2 EA	35	1828	114	6510	0	0	2113	10565
54	.1677159.B	CROSS-CONNECT GROUND WIRES & RUNNING RAILS-OUTSIDE TUNNEL	70 EA	1848	96522	6009	64558	45500	0	53147	265736
54	.1677301.B	TESTING/CHECKOUT/ADJUST	250 MH	275	14363	894	0	0	0	3814	19071
54	.1677311.B	TRAINING/MANUALS	30 HRS	0	0	0	1628	3000	0	1157	5785
54	.1677323.B	SPARE PARTS	45 \$K	0	0	0	48825	0	0	12206	61031
TOTAL OVERHEAD CONTACT SYSTEM (OCS)			63,343		3,308,432	206,170	4,303,584	336,500	2,713	2,039,353	10,196,752
TOTAL SEG 5: SAN JOSE TO GILROY			65,482		3,415,976	214,026	4,350,698	338,630	943,951	2,315,828	11,579,109
REPORT TOTAL											
			313,554		1,026,088	1,113,070	11,095,923				
			16,351,291		20,482,255	5,410,897	55,479,524				



ESTIMATE

The signal estimate is divided into 2 parts. Part 1 is the new track work. This includes segment 1 (the new terminal and Hooper street crossover) and segment 2 (the 16 th street yard). Part 2 is to modify the existing signal system from San Francisco to Gilroy. Part 2 includes the segment 3 (16 th street to Pullman yard), segment 4 (Pullman yard), and segment 5 (Pullman Way Yard to Gilroy). The costs shown for the estimate include materials, installation, test and final design.

PART 1 - SAN FRANCISCO EXTENSION

Seg. 1a Alternative 2A, a two level terminal including racks for train control room in station structure, 6 special mounted signals, 10 switch machines, 14 track circuits, cable, interlocking logic, backup local control panel and CTC equipment. -	\$ 900,000.
Seg. 1b Hooper Street Crossover including bungalow (plus miscellaneous equipment), two signal bridges, 4 signals, 4 switch machines, 6 track circuits, cable, interlocking logic and CTC equipment. -	\$650,000.
Seg. 1c. Line cable (27 conductor 14 Awg.) between bungalows (12,000 ft.) -	\$96,000.
Segment 1 Total -	\$1,646,000
Seg. 2 San Francisco Yard including bungalow, 6 signal bridges, 14 signals, 10 switch machines, 22 track circuits, cable, interlocking logic and CTC equipment. -	\$1,600,000
San Jose CTC equipment, software, installation and test for segments 1 and 2 above. -	\$130,000
PART 1 TOTAL -	\$3,376,000

PART 2 - MODIFICATION OF EXISTING LINE

The modification of the existing signal system would need to be done at night or in a manner to permit operations to continue. This increases unit costs compared to new track.

Segment 3 - San Francisco to Pullman Way Yard -	\$13,963,200
Segment 4 - Pullman Way Yard -	~~\$0~~
Segment 5 - Pullman Way Yard to Gilroy -	\$5,545,700
PART 2 TOTAL	\$ 19,508,900

20,078,900
USE 20,100,000

To: Dev Paul/Kanwaljit Kalsi

From: Robert Boerwinkle

Date: September 15, 1995

Post-It Fax Note	7871	Date	9/15	# of Pages	2
To	Dev Paul/Kanwaljit Kalsi	From	R. Boerwinkle		
Co./Dept		Co.			
Phone #		Phone #			
Fax #		Fax #			

No information was provided about the configuration or type of signal equipment that will be used in the Pullman Way Yard. Therefore, per instructions from Oakland, a hypothetical yard has been assumed as the basis for estimate. It has 12 storage tracks, two maintenance shop tracks, and a double track lead to the mainline. I have assumed that it will be built using DC track circuits with a tower or remote control and that dwarf signal will be used which will still be compatible with the electrification. Cost to convert such a yard signal system to electrification compatible would be approx. \$570,000.

A question has been raised about the need for signal bridges since the traction power poles are intended to be on the side instead of the center of two tracks. This was known. However, signal is always on the right side of the tracks. Poles on the side would always potentially block visibility for one tracks signals. On single track double direction territory the pole would always potentially block visibility for the signal for one direction.

Cal Train Existing Track Signal Modification

	Name & Description	Unit Price	SEG 3 # Units	SEG 3 Ext. Price	SEG 5 # Units	SEG 5 Ext. Price
1	Negative return 250 MCM bonding	\$150	944	\$141,600	534	\$80,100
2	Negative return 350 MCM bonding	\$200	528	\$105,600	528	\$105,600
3	Single track signal bridge	\$35,000	10	\$350,000	3	\$105,000
4	Double track signal bridge	\$50,000	20	\$1,000,000	7	\$350,000
5	Track circuit modification including impedance bond and installation	\$35,000	118	\$4,130,000	47	\$1,645,000
6	Highway grade crossing predictor case replacement for double track	\$80,000	56	\$4,480,000	11	\$880,000
7	Highway grade crossing PSO II transmitter case for double track	\$35,000	56	\$1,960,000	11	\$385,000
8	Highway grade crossing predictor case replacement for single track	\$50,000	0	\$0	21	\$1,050,000
9	Highway grade crossing PSO II transmitter case for single track	\$30,000	0	\$0	25	\$750,000
10	Aerial line wire replacement with buried 27 C -14 Awg. Cost per thousand foot installed	\$8,000	207	\$1,656,000	0	\$0
11	Power wire buried 2 C - 4 Awg. Cost per thousand foot installed	\$5,000	28	\$140,000	39	\$195,000
TOTALS				<u>\$13,963,200</u>		<u>\$5,545,700</u>

CALTRAINS

COMMUNICATIONS

COST SUMMARY

SUBSYSTEM	DATE OF COST BASIS	COST IN '000's
PA	6-22-94	351.2
CCTV	1-26-94	156.8
F&EM	10-27-93	259.2
RADIO	3-23-94	1821.8
TELEPHONE	9-1-95	27.5
SEISMIC	5-25-94	24.7
VMS	7-28-93	201.5
INSTALLATION	5-25-95	664.1
SCADA	9-1-95	196.0
MUX EQP.	12-15-93	165.9

FIBER OPTIC
PAIRS

2973.2 - AMENDMENT
177.2

TOTAL

\$ 6,939.1

CRF
9-5-95

COST ALLOCATION

SWI COMMUNICATIONS ASSOCIATED
W/ OPERATION OF TRACTION POWER
SYSTEM

\$ 300

SWID COMMUNICATIONS REQUIRED FOR
ALL ALTERNATIVES

6,639

6,939

AMENDMENT
TO
COST ESTIMATE FOR CALTRAINS SUBMITTED ON 9-5-95

Spares are estimated as follows:

Total hardware costs, except Radio = 1,382.0 K	
5% of 1,382 K =	69.1 K
Non Radiax portion of Radio = 621.2 K	
10% of 621.2 K =	62.1 K
500' of radiax @ \$87/Ft =	43.5 K
1000' of Fiber cable @ \$2.50/Ft =	2.5 K
 TOTAL SPARES =	 177.2 k

Fiber optic cable, installed is estimated as follows:

Normal installed cost would be \$6.25/Ft.
Because of the multiple tap offs required by ATC
and to cover fiber termination panels, etc. the
installed cost was estimated at \$7.00/Ft.

413,317' of fiber cable @ \$7.00/Ft =	2,893.2 K
---------------------------------------	-----------

TOTAL

3070.4

CRF
9-14-95

STATION COMMUNICATIONS

ASSUMPTIONS

EACH OF 2 LEVELS OF PLATFORM ARE $1000 \times 67.5 \text{ FT} = \text{TOTAL } 135 \text{ K FT}^2$

MEZZINE LEVEL IS $1000 \times 76 \text{ FT} = 76 \text{ K FT}^2$

PUBLIC AREA TOTAL 211 K FT^2

PUBLIC AREA

TYPICAL REG LINE STA. (LITTLE TUNNEY) $= 68 \times 570 \times 2 = 77.5 \text{ K FT}^2$

ANCILLARY AREA $= 120 \times 80 \times 2 = 19.2 \text{ K FT}^2$

RATIO OF PUBLIC AREAS $211 / 77.5 = 2.72$

RATIO OF TOTAL AREAS $= (211 + 19.2) / (77.5 + 19.2) = 2.38$

NOTES -

ANCILLARY AREA INCLUDES TPS. IF ELECTRIFIED A SIGNIFICANT AMOUNT OF 25KV SWITCH GEAR WILL BE REQUIRED TO SECTIONALIZE THE 4 PLATFORM TRACKS AND VARIOUS ARRANGEMENTS FOR THE 2 DOUBLE X-OVERS & THE TWO TURN OUTS LEADING TO THE DOUBLE X-OVERS.

NO SPARES INCLUDED

NO TICKET VENDING EQUIP. INCLUDED

STATION COMMUNICATIONS

P A

ASSUMPTIONS:

P A USED AS FIRE ALARM SYSTEM

WILL NEED IN BOTH PUBLIC & AUXILIARY AREAS

THUS, PA COSTS RATIOED BY 2.38

PRICES (EQP ONLY) BASED ON SESCO AWARD 6-22-94 FOR

MULTIYEAR PROCUREMENT ON RED LINE

1 EA EQP CABINET E/W AMPS, ZONE SELECT, ALARMS, EQUALIZER BR.

49.8K

2 EA EMERGENCY MGT. PANEL EQP (PRI+SEC ENTRANCE)

4.4K

54.2

 $54.2 \times 2.38 = 129.0K$ 79.6K208.6K

NON RECURRING:

MANUALS

9.2

SOFTWARE

9.8

TEST PLANS & PROCEDURES

9.8

INSTALLATION PLANS

9.8

TECH. SUPPORT

6.4

DISC

2 18.063.0K

NEED TO ADD SPKRS.

~~11500~~ $5K \times \frac{1}{5} \text{ STA}$ 300/ STA. RED LINE $\times 2.38 = 714 \text{ SPKRS}$

ATELAS SOUND LIAISON APC-30

 $111.50 / \text{EA} \times 714 = 79.6K$ COTD
12-10
300/ STA.

STATION COMMUNICATIONS

CCTV

CCTV COVERAGE ON RED LINE IS BASICALLY PLATFORM
(CENTER PORTION MAINLY), FARE VENDING MACHINES, AND
ESCALATORS. I.E. PUBLIC AREAS ONLY, THUS RATIO OF
2.72 WILL BE USED. COSTS BASED ON ETA TECH. BID OF
1-26-94 (MULTI YEAR PROCUREMENT)

CAMERAS

$$33.5 \text{ K} \times 2.72 = 91.3 \text{ K}$$

COMMON EQP

$$13 \text{ K} \times 1 = 13.0 \text{ K}$$

MONITORS

$$5.9 \text{ K} \times 2.72 = 16.1 \text{ K}$$

120.4 K

NON RECURRING

MANUALS

9.0

TRAINING

14.3

TEST EQP.

9.6

TECH SUPPORT

3.536.4 K

STATION COMMUNICATIONS

FIRE & EMERG. MGT.

ASSUMPTIONS: WILL NEED IN BOTH PUBLIC & AUXILIARY AREAS.

THUS, 2.38 RATIO USED

THERE WILL BE BOTH A PRIMARY AND SECONDARY RESPONSE POINT FOR EMERGENCY

SERVICES. COSTS BASED ON AXIAL CORP

BID OF ~~10~~ 10-27-93

SMOKE/FIRE DET.	10.54	X 2.38	=	25.1 K
W/ LARG. RDR.				
INTRUSION DET. PUBLIC AREA	.95	X 2.38	=	2.3 K
" " AUXILIARY	7.49	X 1	=	7.5 K
EMERG. EXIT INTRUSION DET.	7.16	X ~~2.38~~ ^{2.72}	=	19.5 K
BLU LITE STA.	1.449	X (8 BW PLAT + 4 X-OVER)	=	48.4 K
EMP		20 X PASSAGE	=	18.3
GP				1.3
NON RECURRING-				
MANUALS	5.3			
SYS. ASSURANCE	20.9			
ENG.	24.5			
S/W ENG & PROG.	10.5			
ACCT TEST	17.9			
TECH SUPPORT	9.0			
	88.1 K			
		ERR. RM.		50.7
				<u>171.1 K</u>

NOTE- EMC THINKS CONTRACTOR SIGNIFICANTLY UNDER BID
± 30% ON THIS CONTRACT.

STATION / TUNNEL COMMUNICATIONS
RADIO

ASSUMPTIONS - PER TOM HERROLD (SP?) OF BART, GREATER S.F. PUBLIC

SERVICE AREA WILL HAVE A TRUNKED 800 MHZ RADIO SYSTEM
FOR ALL LOCAL GOVT. SERVICES. HE SUGGESTS ^{TWO} ~~ONE~~ EA
800 MHZ CHANNELS IN TUNNEL / STATION, ^{ONE} FOR ~~THE~~ FIRE
SERVICES AND ONE FOR LOCAL POLICE.

ADDITIONALLY, ASSUME 3 EA 160 MHZ CHANNELS FOR RR.
USE, I.E. 1-TRAIN OPERATIONS, 1-RR POLICE, 1-MAINTENANCE.

CANNOT FEED 1.5 MILES OF TUNNEL @ 800 MHZ WITH BASE
STATIONS AT EACH END. THEREFORE, ASSUME 2 RADIO TX
CABLES IN EACH TUNNEL (ONE TX - ONE RX PER TUNNEL)
WILL NEED LINEAR AMPS @ 800 MHZ AT 1/4 TUNNEL LENGTH
TO BOOST BASE STATIONS.

PRICES BASED ON AMELCO BID OF 3-23-94

VHF BASE STATIONS	2 EA @ 6.7K	=	13.4 K
800 MHZ BASE STATIONS	2 EA @ 6.7K	=	13.4 K
800 MHZ RPTX/AMPS	4 EA @ 138.5K	=	554.0K
SPLITTERS, COMBINERS ETC		=	40.4 K
STATION CABLING	2.37 x 2.3B	=	5.6 K
TUNNEL CABLING @ 87/FT (4 CABLES) x 10115'		=	880.0K
			<u>1,506.8 K</u>

INSTALLATION

110 K

MANUALS

10 K

TRAINING

20 K

ENG.

165 K

TECH. SUPPORT

10 K

315 K

STATION COMMUNICATIONS

TELEPHONE & SEISMIC & INSTALLATION

F&E
PA & CCTV

EACH ETS NEEDS PHONE = 34

2 PASSENGER ASST / PLATFORM = 4

ELEVATORS = 3

FARE VENDING = 4

AUXILIARY ROOMS ≈ 20

EMERG. EXITS = 4

CONTROL CTR. = 4

43

\$500/LINE USUAL INSTALLED COST OF PBX (NO RED LINE EQUIVALENT)

ASSUME 50 LINE @ .5K/LINE = 25K

ADD 10% FOR SPARE CAPACITY + SPECIAL TRUNKS = 2.5K

27.5K

SEISMIC

BASED ON L.H. COMSTOCK BIO 5-25-94

SEISMIC EQP/STA

20.3K

INSTALL

~~13.4~~

TRAINING

4.4K24.7~~38.1K~~

ALSO COMSTOCK BIO 5-25-95

PA

19.63 x 2.38 = 46.7K

CCTV

29.58 x 2.72 = 80.5K

SEISMIC

13.4 x 1 = 13.4K

F&E

153.4 x 2.38 = 365.3K

VMS

11.25 x 2.72 = 30.6K

MOF + X-CONNECTS

38.56 x 2.38 = 91.8K

MISC. OUTLINER, SEISMIC BRACE
INTERPHONE RELAYS, ETC.

15.02 x 2.38 = 35.8K

664.1K

STATION COMMUNICATIONS

VMS

ASSUMPTIONS -

VMS WILL MEET ADA REQUIREMENTS.

THEREFORE SIGNS WILL BE NEEDED IN ALL PUBLIC AREAS, INCLUDING STATION ENTRANCES.

VMS NOT REQUIRED IN ANCILLARY AREAS

THEREFORE RATIO OF 2.72 VS REG LINE IS USED

COSTS BASED ON SESCO BID OF 7-28-93

STATION CONTROL UNITS (1 EA)		4.4 K
STROBES 1.54×2.72	=	4.2 K
DISPLAY UNITS 11.89×2.72	=	32.3 K
WEATHER PRNT DISPLAYS 4.1×2.72	=	12.0 K
DISPLAY UNITS EDGE LIT 18.6×2.72	=	50.6 K
		<u>103.5 K</u>

NON RECURRING

TEST EQP	4.9 K
ENG./MOB/MGT/TECH SUPPORT	<u>93.1</u>
	98.0 K

SCADA & F.O. WITH MUX EQP.

ASSUME 4 TPS's + 3 SECTIONALIZATION LOCATIONS + TERMINALS
PER FRED MARTINO OF MACRO CORP. THE MASTER STA.

FOR ~~WORK~~ SUCH A SMALL SYSTEM WOULD BE 80K

CONSULTING & COORDINATION OF DESIGN 20K

REMOTE TERMINAL UNITS @ 12K EA X 8 96K

196K

IN 4-5 YEAR PLC'S SHOULD BE CONFIGURABLE TO ACT AS RTU,
THUS, POSSIBLY 96K COULD BE CUT FROM ESTIMATE.

FIBER OPTIC -

MEN SHOULD PRICE OUT A CABLE PULLED INTO EXISTING DUCT
FOR THE LENGTH OF THE SYSTEM. AS A MINIMUM 8
FIBERS ARE NEEDED (4 COMM, 4 ATC) SUGGEST 12 FIBERS
TO ALLOW FOR SPARES.

MUX EQP. NEED 9 ~~EA~~ EA, ONE AT EACH BREAKER LOCATION + ONE
AT CENTRAL CONTROL

PRICES BASED ON ETA TECH BID OF 12-15-93

CHANNEL BANKS 2.58 x 9 x 2
NEED REDUNDANCY

46.4

~~23.2~~

4 WIRE I/O CARDS 6 x 9 x 2 x .258

27.9

POWER SUPPLIES 2.31 x 9 x 2

41.6

115.9K

TECH SUPPORT

10K

ENG.

20K

DOCUMENTATION

20K

50K

CALTRAIN DOWNTOWN EXTENSION
LNG FUELING FACILITY

DESIGNED BY R. [Signature] DATE 10/1/19

CHECKED BY _____ DATE _____

MAJOR LNG FUELING FACILITY
IN SAN JOSE,

USE \$1,500,000

MINOR LNG FUELING FACILITY
IN SAN FRANCISCO

USE \$500,000

Total = \$2,000,000

* COST PER DISCUSSION WITH
DAVE MINISTER.

---WORK BREAKDOWN--- FACIL-STANDRD.WKPKG										EQUIP- MENT				TOTAL DOLLARS	
DESCRIPTION										SUB- CONTRACT		OH&P		=====	
QUANTITY										MATERIAL		=====		=====	
MANHOURS										EQUIP USAGE		=====		=====	
LABOR										=====		=====		=====	
16TH ST. YARD										=====		=====		=====	
610	.0212210.	CLEAR & GRUB	48165 SY	1445	51827	14112	0	0	0	0	26376	92315			
610	.0220240.	HAUL TO DUMP DEBRIS	4900 CY	0	0	0	0	0	0	49000	0	2450	51450		
610	.0225001.	PREPARE SUBGRADE	48165 SY	530	22760	12234	0	0	0	0	13998	48992			
610	.0225351.	PAVEMENT MARKING	1 LS	0	0	0	0	0	0	5000	0	250	5250		
610	.0268001.	SITE DRAINAGE	1 LS	0	0	0	0	0	0	500000	0	25000	525000		
610	.0271128.	FENCE, 8' HIGH, CHAIN LINK	2550 LF	523	18596	2224	19367	0	0	0	10265	50452			
		W/ BARBED WIRE													
610	.0271148.	FENCE GATE, VEHICLE 8'	72 LF	38	1351	162	2969	0	0	0	902	5384			
		CHAIN LINK													
610	.0282003.	3" A.C. PAVING OVER 6" AGG.	8925 SY	1071	40998	11915	93069	0	0	0	30472	176454			
		BASE (INCL SUBBASE AND													
		FINISH COURSE)													
610	.0310100.	FORMS - GENERAL	12050 SF	2531	113456	2422	11636	0	0	0	31879	159393			
610	.0332300.	REBAR - GENERAL	126000 LB	1134	47916	8190	35545	0	0	0	22913	114564			
610	.0334300.	CONCRETE - SLAB ON GRADE	1400 CY	700	26198	4318	97216	0	0	0	31933	159665			
610	.1310001.	MISC SERVICE BLDGS	4200 SF	0	0	0	0	0	0	336000	0	16800	352800		
610	.1310002.	PARKING SHED	9460 SF	0	0	0	0	0	0	283800	0	14190	297990		
610	.1310003.	GUARD HOUSE	1 EA	0	0	0	0	0	0	15000	0	750	15750		
610	.1573251.	FIRE PROTECTION	433500 SF	2601	0	0	0	0	0	433500	0	21675	455175		
610	.1573259.	INCOMING UTILITY CONNECTIONS	1 LS	0	0	0	0	0	0	500000	0	25000	525000		
610	.1575256.	GENERAL MAINT EQUIP	1 LS	0	0	0	0	0	0	0	542500	27125	569625		
610	.1610010.	YARD LIGHTING	264000 SF	0	0	0	0	0	0	92400	0	4620	97020		
TOTAL 16TH ST. YARD										10,573	323,102	55,577	2,214,700	542,500	3,702,279
REPORT TOTAL										10,573	323,102	55,577	2,214,700	542,500	3,702,279

---WORK BREAKDOWN---											TOTAL
FACIL.STANDRD.WKPKG											DOLLARS
=====											=====
DESCRIPTION											=====
=====											=====
QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB- CONTRACT	EQUIP- MENT	OH&P				
=====	=====	=====	=====	=====	=====	=====	=====				=====
BAYSHORE YARD											
620	.0212210.	36045 SY	1081	38771	10561	0	0	19733			69065
620	.0220240.	6000 CY	0	0	0	60000	0	3000			63000
620	.0225001.	36045 SY	396	17006	9155	0	0	10464			36625
620	.0225352.	1 LS	0	0	0	3000	0	150			3150
620	.0268001.	1 LS	0	0	0	500000	0	25000			525000
620	.0271128.	6400 LF	1312	46650	5581	48608	0	25753			126592
FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE											
620	.0271148.	22 LF	12	427	50	907	0	282			1666
FENCE GATE, VEHICLE 8'											
CHAIN LINK											
620	.0282003.	745 SY	89	3407	995	7769	0	2538			14709
3" A.C. PAVING OVER 6" AGG. BASE (INCL SUBBASE AND FINISH COURSE)											
620	.0310100.	7975 SF	1675	75085	1603	7701	0	21097			105486
620	.0332300.	130500 LB	1175	49649	8483	36814	0	23737			118683
620	.0334300.	1450 CY	725	27133	4472	100688	0	33073			165366
620	.1310001.	1152 SF	0	0	0	92160	0	4608			96768
620	.1310003.	1 EA	0	0	0	15000	0	750			15750
620	.1573251.	324400 SF	1946	0	0	324400	0	16220			340620
620	.1573259.	1 LS	0	0	0	500000	0	25000			525000
620	.1575256.	1 LS	0	0	0	0	0	27125			569625
620	.1610010.	310000 SF	0	0	0	108500	0	5425			113925
TOTAL											2,891,030
BAYSHORE YARD											

D. Minister
15 Sept. '95

Locomotives

Electric — \$ 4.7 million

Dual-Mode — — ^{ASSUME} \$7 million each x 23 loco's

Clean — — see SWRI \$ conversion costs

LNG — — see SWRI \$ conversion costs

Gallery Cars — All ALT's — 25 new gallery cars
@ \$1.8 mil. each

15

CALTRANS.F. DOWNTOWN EXTENSION DEIS/DEIR PROJECT

2010 RIDERSHIP PROJECTIONS AND REQUIRED CALTRAIN FLEET SIZE

A. CalTrain Ridership Projections

2010 Average Weekday Ridership Forecast per MTC 1994 RTP Model Runs Factored by ~25% to Account for Relief from Park & Ride Lot Capacity Constraints, New BART/CalTrain Transfer Plan and Fare Policies, New ALRT/CalTrain Connection at Milbrae, as well as Several Other Changes:

- Market/Beale Terminal Station: 20,000+
 - Mission Bay Intermediate Station: 10,000+
-

Total Ridership At Peak Load Point: 30,000+ (2-way trips)

Total AM CalTrain Ridership at Peak Load Point = $30,000 \div 2 = 15,000$;

Reverse Direction CalTrain Ridership (S.F. to Peninsula) = $15,000 \times \sim 0.20 = \sim 3,000$;

Peak Direction CalTrain Ridership (Peninsula to S.F.) = $15,000 \times \sim 0.80 = \sim 12,000$;

Peak-Hour, Peak Direction CalTrain Ridership = $12,000 \times \sim 0.60 = \sim 7,200$.

B. CalTrain Passenger Car Needs to Carry Ridership Demand

~7,200 peak-hour, peak direction passenger demand at peak load point $\div$ by 7 peak-hour, peak direction trains = ~1,000+ passengers per train;

~1,000 passengers $\div$ by 150 passengers per car (145 seated + 5 standees) = 7 cars/train required on all AM peak-hour northbound trains;

Similarly, ~1,800 peak-hour, reverse direction passengers $\div$ by 4 peak-hour, reverse direction trains = ~450+ passengers per train;

~450 passengers $\div$ by 150 passengers per car (145 seated + 5 standees) = 3 cars/train required just to handle S.F. reverse commute demand; need to add ~2 additional cars/train to handle the Peninsula reverse commute demand, for a total of ~5 cars/train on all AM peak-hour southbound trains.

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ESTIMATING SERVICES

A total of 17 trains are required to operate the peak-hour CalTrain schedule for both the 60 trains/day and the 86 trains/day schedules. ~Eight of these trains need to have seven cars each, and the remaining nine need to have five cars each during peak periods in the Year 2010 to meet the forecast ridership demand.

Thus the required 2010 CalTrain Passenger Car Requirements are estimated to be as follows:

- 8 trains @ 7 gallery cars each = 56 cars;
- 9 trains @ 5 gallery cars each = 45 cars;

Total = 17 trains and 101 cars;

Spares @ 14% = 14 cars;

Total Gallery Cars Required = 115 Gallery Cars;

Existing CalTrain fleet = 73 gallery cars + ¹⁷20 gallery cars now on order = ⁹⁰93 cars; therefore ²⁵22 new gallery cars will be required by Year 2010 to handle the forecast ridership demand.

The capital costs for acquiring these ²⁵22 additional gallery cars is estimated to be about ²⁵22 @ \$1.8 million each = \$36 million plus the normal add-ons for procurement costs, contingencies and project reserve.

¹\$45

KAISER ENGINEERS

QUANTITY SHEET

REF. NO. _____

SHEET 1 OF 3

DATE 2/6/2005

BY BCL & DM

CHECKED BY REV BCL 9/12/05 1/25/06

JOB NO. 65928

SUBJECT CALTRAIN DTV

TITLE _____

DRG. _____ - R _____

BUS FACILITIES
- VROM -

DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT OR WEIGHT	QUANTITY	TOTAL QUANTITY
TB TB-1 (MAIN/BEAR BUS TEAM) W/ ACTS 2					1, 23, 2 C	
GROUND LEVEL						
N GROUND FLOOR		210	275		57750	
@ N		100	80		8000	
S GROUND FLOOR		330	140		46200	
@ W		100	135		13500	
						124450
LOWER BUS LEVEL						
		630	275		173250	
UPPER BUS LEVEL						
SAME					173250	
TOTAL						471950 SF
					@ 135	63713000
BUS PLAZA @ 75/SF						
		230	135			31050 SF
					@ 75	2,329,000
SUB TOTAL						66,042,000
OLD TB					4600,000	
RAMP DEMO					3400,000	
NEW RAMPS					15448,000	
TOTAL OTHER						23,458,000
NO TEMP BUS FACILITY REQUIRED						
						4,574,000
WITH ADD-ONS @ 1.62 = \$145,000,000					USE	150,000,000

KAISER ENGINEERS

QUANTITY SHEET

REF. NO. _____

SHEET 2 OF 3

DATE 7/22/05

BY BLL

CHECKED BY _____

JOB NO. 65223

SUBJECT CAUTRAIN DTX

TITLE _____

ORG. _____ -R _____

BUS FACILITIES
- YROM -

REV BLL 9/22/05

DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT OR WEIGHT	QUANTITY	TOTAL QUANTITY
TBTL (TBTRM CON)				N/ALT 3A		
GROUND LEVEL BUILDING 1		450	130		58 500 SF	*
BUILDING 2		270	250		67 500	*
*DO NOT ADD PER RP	8/25/05					
MISCELLANEOUS	2	180	164		59 040	
TOP DECK		1340	164		219 760	
						278 800 SF
					@ 115	*32,062,000
GROUND BUS PLAZA		300	164		49 200	
					@ 75	3,690,000
						*35,752,000
RAMP DEMO (IN CAUTRAIN)		PER KE 8/7			~~340,000~~	
RAMP RECONST		PER KE 8/7			15,448,000	
TEMP BUS MTR FACILITY		PER PS			7,500,000	
						27,948,000
TEMP BUS FACILITY REQUIRED						*58,700,000
WITH ADD-ONS @ 1.62						US\$ 90,000,000

**KAISER
ENGINEERS**

JOB NO. 65928

TITLE _____

DRG. _____ -R _____

QUANTITY SHEET

SUBJECT CALTRAIN DTX

Bus Facilities - VIROM -

REF. NO. _____

SHEET 3 OF 3

DATE 9/22/75

BY BCC & JH

CHECKED BY 1254 BCL 9/22/98

DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT OR WEIGHT	QUANTITY	9/25/95 TOTAL QUANTITY
T13TM (TRANS BAY (8' x 11' x 11' MEDIUM) w/					Alt 3B	
Ground Level						
E BLOC		420	140		58800 SF *	
MID BLOC		270	240		64800 *	
Lower Level BUS Deck		1200	164		196800	
Upper Level BUS Deck					196800	
PER DISCUSSION w/ RP 9/25/95				DON'T USE USE	577200 SF 383000 SF	
					@ 115	\$44,000,000
BUS PAVES			300	164		49200 SF
					@ 75	3,690,000
TOTAL BUS TERM						47,690,000
OTHER USE SHEET 2						22,948,000
TOTAL						\$70,638,000
WITH ADD-ONS @ 1.62 =					\$114,434,000	USE \$120,000,000
* DON'T ADD PER RP 9/25/95						



ICF KAISER

CALTRAIN DOWNTOWN EXTENSION

SAN FRANCISCO, CALIF.

RIGHT-OF-WAY & RELOCATION

09/27/95
BY BCC/RLM

SEG #	SEGMENT DESCRIPTION	R.O.W. PURCHASE	R.O.W. RESALE (NET)	R.O.W. TOTAL	RELOCATION	TOTAL
1A	APPROX. IRWIN & SEVENTH TO APPROX. THIRD & TOWNSEND VIA CUT-AND-COVER CONSTRUCTION. PORTAL ON TOWNSEND BETWEEN FIFTH AND FOURTH.	\$1,450,740		\$1,450,740	\$300,000	\$1,750,740
1B	APPROX. IRWIN & SEVENTH TO APPROX. THIRD & TOWNSEND VIA CUT-AND-COVER CONSTRUCTION. PORTAL ON SEVENTH NEAR BERRY.	\$1,450,740		\$1,450,740	\$400,000	\$1,850,740
2	APPROX. THIRD & TOWNSEND TO BRYANT VIA MINED TUNNEL CONSTRUCTION.	\$6,723,050	\$3,000,000	\$3,723,050	\$100,000	\$3,823,050
3AC	APPROX. BEALE AND BRYANT TO A THREE LEVEL CENTER PLATFORM UNDERGROUND (CUT-AND- COVER) TERMINAL AT MARKET/BEALE.	\$6,301,538		\$6,301,538	\$1,000,000	\$7,301,538
3AM	APPROX. BRYANT TO A THREE LEVEL SIDE PLATFORM UNDERGROUND (CUT-AND-COVER) TERMINAL AT MARKET/BEALE.	\$9,535,333		\$9,535,333	\$1,000,000	\$10,535,333
3BC	APPROX. BEALE AND BRYANT TO A TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT-AND- COVER) STAGGERED TERMINAL AT MARKET/BEALE.	\$6,301,538		\$6,301,538	\$1,000,000	\$7,301,538
3BM	APPROX. BRYANT ST. TO A TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT-AND-COVER) STAGGERED TERMINAL AT MARKET/BEALE.	\$9,535,333		\$9,535,333	\$1,000,000	\$10,535,333
3CC	APPROX. BEALE AND BRYANT TO A NEW TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT-AND- COVER) TERMINAL BETWEEN MISSION AND FOLSOM.	\$301,538		\$301,538	\$0	\$301,538
3CM	APPROX. BRYANT ST. TO A NEW TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT-AND-COVER) TERMINAL BETWEEN MISSION AND FOLSOM.	\$3,535,333		\$3,535,333	\$0	\$3,535,333
4	APPROX. THIRD AND TOWNSEND TO DELANCEY AND TOWNSEND, VIA CUT-AND-COVER CONSTRUCTION.	\$447,000		\$447,000	\$0	\$447,000



ICF KAISER

CALTRAIN DOWNTOWN EXTENSION

SAN FRANCISCO, CALIF.

RIGHT-OF-WAY & RELOCATION

09/27/95

BY BCC/RLM

SEG #	SEGMENT DESCRIPTION	R.O.W. PURCHASE	R.O.W. RESALE (NET)	R.O.W. TOTAL	RELOCATION	TOTAL
5	APPROX. DELANCEY AND EMBARCADERO TO BRYANT AND BEALE, VIA CUT-AND-COVER UNDER THE EMBARCADERO	\$2,666,287		\$2,666,287	\$0	\$2,666,287
6A	APPROX. IRWIN & SEVENTH TO APPROX. SECOND & KING VIA CUT-AND-COVER CONSTRUCTION. PORTAL ON KING, 400' EAST OF SIXTH ST.	\$0		\$0	\$0	\$0
6B	APPROX. IRWIN & SEVENTH TO APPROX. 2ND & KING VIA CUT-AND-COVER CONSTRUCTION. PORTAL ON SEVENTH NEAR BERRY.	\$0		\$0	\$0	\$0
7	SECOND & KING TO BRYANT & COLIN P. KELLY, VIA COLIN P. KELLY	\$1,633,005	\$1,344,000	\$289,005	\$0	\$289,005
8	BRYANT & COLIN P. KELLY TO FOLSOM PORTAL, VIA MINED TUNNEL CONSTRUCTION.	\$0		\$0	\$0	\$0
9A	FOLSOM PORTAL, AERIAL TO NEW AERIAL TERMINAL ON TRANSBAY SITE	\$3,800,000		\$3,800,000	\$700,000	\$4,500,000
9B	FOLSOM TO NEW UNDERGROUND TERMINAL ON TRANSBAY SITE	\$3,800,000		\$3,800,000	\$700,000	\$4,500,000
10	APPROX. THIRD & TOWNSEND TO BRYANT & COLIN P. KELLY, VIA SHORT RADIUS TURN.	\$3,259,227	\$1,568,000	\$1,691,227	\$300,000	\$1,991,227
11	APPROX. THIRD & TOWNSEND TO BRYANT & COLIN P. KELLY, VIA LONG RADIUS TURN.	\$80,000		\$80,000		\$80,000
12	KING AND 2ND TO APPROX. DELANCEY AND THE EMBARCADERO VIA CUT-AND-COVER.	\$0		\$0		\$0
SW1	TRACTION POWER (DWTN SAN FRANCISCO TO GILROY)			\$0		\$0



ICF KAISER

CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
RIGHT-OF-WAY & RELOCATION

09/27/95

BY BCC/RLM

SEG #	SEGMENT DESCRIPTION	R.O.W. PURCHASE	R.O.W. RESALE (NET)	R.O.W. TOTAL	RELOCATION	TOTAL
SW2	TRACTION POWER (DWTN SAN FRANCISCO TO IRWIN)			\$0		\$0
SW3	SATELLITE STORAGE YARD (16TH STREET / I-280)			\$0	\$1,000,000	\$1,000,000
SW4	SATELLITE STORAGE YARD (BAYSHORE IN BRISBANE)			\$0		\$0
SW5	PULLMAN WAY, SAN JOSE L.N.G. FUELING FACILITY			\$0		\$0
SW6	NEW ELECTRIC LOCOMOTIVES			\$0		\$0
SW7	NEW DUAL-MODE LOCOMOTIVES			\$0		\$0
SW8	DIESEL LOCOMOTIVE CONVERSION TO L.N.G.			\$0		\$0
SW9	CLEAN DIESEL LOCOMOTIVE UPGRADE			\$0		\$0
	MISC. SYSTEM WIDE ELEMENTS					

ASSUMPTIONS AND LIMITING CONDITIONS

Sedway & Associates (S&A) assumes no liability for matters that are legal in nature, such as title, liens and encumbrances.

All information used in this study has been obtained from sources deemed to be reliable; however, no responsibility is assumed for accuracy. We have no responsibility to update this report for events and circumstances occurring after the date of this report. Further, no guarantee is made as to the possible effect on development of present or future federal, state or local legislation, including any regarding environmental or ecological matters.

The accompanying analyses are based on estimates and assumptions developed in connection with the study. In turn, these assumptions, and their relation to the estimates, are developed using currently available economic data and other relevant information. It is the nature of forecasting, however, that some assumptions may not materialize, and unanticipated events and circumstances may occur. Therefore, actual results will likely differ from estimates, and some of the variations may be material to the conclusions of the analysis.

The existence of hazardous substances, including without limitation asbestos, polychlorinated biphenyls, petroleum leakage, or agricultural chemicals, which may or may not be present at the properties, as well as other possible environmental conditions that may or may not affect the properties, are beyond the scope of this study. If any hazardous substances or environmental conditions are present, the values and optimal uses of the properties may be affected. No responsibility is assumed for any such substance or condition.

Contractual obligations do not include access to or ownership transfer of any electronic data processing files, programs or models completed directly for or as by-products of this research effort, unless explicitly so agreed as part of the contract.

The report may not be used for any purpose other than that for which it is prepared. Neither all nor any part of the contents of this study shall be disseminated to the public through publication advertising media, public relations, news media, sales media, or any other public means of communication without prior written consent and approval of S&A.

This report is also subject to various specific assumptions and limiting conditions presented in the body of the report.

EXHIBIT 1
CALTRAIN DOWNTOWN STATION RELOCATION STUDY (TASK 5)
PROPERTIES IMPACTED BY SEGMENT

Property Address	Use/ Improvements	Land Sq. Ft.	Bldg. Sq. Ft.	Zoning	Block/ Lot	Ownership	Type of Impact	Sq. Ft. Impacted	Comments
Segment 1									
7th St. from 16th St. to King	CalTrain	NA					NA	NA (1)	
E/S 7th St. between King & Townsend	CalTrain	226,875			3798/1	Catellus	Fee Take	28,000	Already has permanent easement.
S/S Townsend between 4th St. & 7th St.	CalTrain	NA				Catellus	Fee Take	110,553	Already has permanent easement.
S/S Townsend between 3rd St. & 4th St.	S.F. RV Park	226,875	NA	CM/MB	3795/3,4	Catellus	Fee Take	23,379	
Townsend between 3rd St. & 7th St.	City Street					City	Public ROW Easement		
Sub-Totals		453,750	0					161,932	
Segment 2									
695 3rd St.	Unknown Building	6,000	6,252	SLI	3788/14	Michael R. Sparer	Fee Take	6,252	Building area.
685 3rd St.	Unknown Building	3,998	20,878	SLI	3788/15	Stanley and Nancy Chia	Fee Take	20,848	Building area.
180 Townsend St.	Unknown Building	9,997	29,991 (est.)	SLI	3788/13	Jack and Lukra Mariani Trust	Fee Take	29,991	Estimated building area.
178 Townsend St.	Unknown Building	22,000	75,340	SLI	3788/12	Bea Hill Family Trust	Fee Take	75,340	Building area.
164 Townsend St.	Unknown Building	16,496	29,025	SLI	3788/11A	Dirk and Barbara Vanmeurs, Trustees	Permanent Easement	63,000	Est. land area of nine easements.
148 Townsend St.	Unknown Building	23,674	45,580	SLI	3788/10	Peggy J. Field Survivors Trust	Permanent Easement		
144 Townsend St.	Unknown Building	16,496	NA	SSO	3788/9A	McCarthy, John and Son	Permanent Easement		

continued

EXHIBIT 1
CALTRAIN DOWNTOWN STATION RELOCATION STUDY (TASK 5)
PROPERTIES IMPACTED BY SEGMENT

Property Address	Use/ Improvements	Land Sq. Ft.	Bldg. Sq. Ft.	Zoning	Block/ Lot	Ownership	Type of Impact	Sq. Ft. Impacted	Comments
Segment 2 (continued)									
130 Townsend St.	Unknown Building	22,000	9,600	SSO	3788/8	Gregory and Susan Melanson	Permanent Easement		Also includes small portion of Stanford Alley.
136 Townsend St.	Unknown Building	18,948	NA	SSO	3788/9	John Fox	Permanent Easement		
329 Brannan St.	Buildings with parking	NA	13,740	SSO	3788/42	Jack and Taeko Like	Permanent Easement		
640 2nd St.	Unknown Building	8,790	NA	SSO	3788/2	640 Second St. Associates	Permanent Easement		
35 Stanford St.	Unknown Building	15,999	NA	SSO	3788/38	Pacific Elevators & Equip. Co.	Permanent Easement		
301 Brannan St.	Unknown Building	17,000	80,640	SSO	3788/37	Brannan St. Properties	Permanent Easement		
601 2nd Street	2nd St. Storage (old brick bldg.)	17,531	105,186	SSO	3789/8	611 Second St. Partners	Permanent Easement	2,188	
599 2nd Street	Retail building w/ parking	16,000	30,480	M2	3774/31,63	Phoenix Industries	Permanent Easement	78,000	Est. land area of 10 easements.
274 Brannan St.	Unknown Building	22,525	102,933	M2	3774/73	Hawley Terminal, Inc.	Permanent Easement		
270 Brannan St.	Parking Lot & "S. Beach Billiards"	37,812	17,350	M2	3774/26	Wuteh of China, Inc.	Permanent Easement	16,100	
51 Federal St.	Unknown Building	6,970	27,122	M1	3774/13	51 Federal St. Associates	Permanent Easement		Also includes a small portion of Federal St.
41 Federal St.	Unknown Building	6,000	NA	M1	3774/15	Sara Lee Corp.	Permanent Easement		
230-240 Brannan St.	Unknown Building	37,812	127,396	M2	3774/25	Sara Lee Corp.	Permanent Easement		
550 First St.	Unknown Building	20,240	57,600	M1	3774/18	SFRA	Permanent Easement		

continued

EXHIBIT 1
CALTRAIN DOWNTOWN STATION RELOCATION STUDY (TASK 5)
PROPERTIES IMPACTED BY SEGMENT

Property Address	Use/ Improvements	Land Sq. Ft.	Bldg. Sq. Ft.	Zoning	Block/ Lot	Ownership	Type of Impact	Sq. Ft. Impacted	Comments
Segment 2 (continued)									
540 1st St.	Unknown Building	8,276	24,000	M1	3774/2	Cape Horn Associates	Permanent Easement		
W/S 1st St.		8,000	Vacant	M1	3774/1,62	SFRA	Permanent Easement		
N/S Federal St.		23,666	NA	M1	3774/4-7	Paul and Margot Stensland	Permanent Easement		
2nd St. at Brannan St.	City Street					City	Public ROW Easement		
Sub-Totals		386,230	803,113					291,719	
Segment 3 AM, 3 BM & 3 CM									
W/S Beale, north of I-80	Parking Lot	72,858	NA	M1	3766/9	Manesco	Permanent Easement	29,219	
370 Beale St.	Parking Lot	40,174	NA	RC4	3747/21	CNS Partners #2 Ltd.	Perm. Easement & Const. Easement	16,406	
Bryant and 1st Sts.	City Streets					City	Public ROW Easement		
N/S Bryant (& under I-80)	Bridge Approach					CalTrans	Public ROW Easement		
Harrison, West of Beale	City Street					City	Public ROW Easement		
Beale from Harrison to Folsom	City Street					City	Public ROW Easement		
Beale St. from Folsom to Market	City Street					City	Public ROW Easement		
133 Beale Street (partial lot)	Restaurant	48,813 (total)	Vacant	P	3718/25 (partial)	CalTrans	Fee Take (2)	938	
Sub-Totals		161,845	0					46,563	

continued . . .

**EXHIBIT 1
CALTRAIN DOWNTOWN STATION RELOCATION STUDY (TASK 5)
PROPERTIES IMPACTED BY SEGMENT**

Property Address	Use/ Improvements	Land Sq. Ft.	Bldg. Sq. Ft.	Zoning	Block/ Lot	Ownership	Type of Impact	Sq. Ft. Impacted	Comments
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Segment 3 AC, 3 BC & 3 CC

NEC Bryant & Beale	CalTrans Maint. Yard	93,637	Vacant	M1	3767/3.4	CalTrans	Perm. Easement & Const. Easement	2,344	
Beale from Bryant to Folsom	City Street					City	Public ROW Easement		
Beale St. from Folsom to Market	City Street					City	Public ROW Easement		
133 Beale Street (partial lot)	Restaurant	48,813 (total)	Vacant	P	3718/25 (partial)	CalTrans	Fee Take (2)	938	
Sub-Totals		142,450	0					3,282	

Segment 4

701 3rd St.	Restaurant w/ Parking	13,750	1,716	M2	3794/6	Grosvenor Third St. Associates	Permanent Easement	938	
183 Townsend St.		5,153	Vacant	M2	3794/7	183 Townsend Corporation	Permanent Easement	234	
175 Townsend St.	Unknown Building	NA	NA	NA	3794/8	Unknown	Permanent Easement	156	
Townsend between 3rd St. & Embarcadero	City Street					City	Public ROW Easement		
Sub-Totals		18,903	1,716					1,328	

Segment 5

SEC Bryant & Beale	Parking Lot	97,700	Vacant	M2	3771/1	City	Perm. Easement & Const. Easement	21,328	
Embarcadero between Townsend & Brannan	City Street					City	Public ROW Easement		
Sub-Totals		97,700	0					21,328	

continued

EXHIBIT 1
CALTRAIN DOWNTOWN STATION RELOCATION STUDY (TASK 5)
PROPERTIES IMPACTED BY SEGMENT

Property Address	Use/ Improvements	Land Sq. Ft.	Bldg. Sq. Ft.	Zoning	Block/ Lot	Ownership	Type of Impact	Sq. Ft. Impacted	Comments
Segment 6									
7th St. from 16th St. to Berry	CalTrain						NA		(1)
Block bounded by Berry, 6th St., 7th St. & King	Basically Vacant	198,000		M2/ MB	3798/2	Catellus	Fee Take	73,063	Area includes all of following entry. Already has Permanent Easement.
Block bounded by Berry, 5th St., 6th St. & King	Basically Vacant	198,000		M2/ MB	3797/2	Catellus	Fee Take		
Portion under I-280	I-280 Ramps					CalTrans	Public ROW Easement		
King St. between 5th St. & 2nd St.	City Street					City	Public ROW Easement		
Sub-Totals		396,000	0					73,063	
Segment 7									
NEC 2nd & King	Basically Vacant	74,923	14,888	M2	3793/1	Embarcadero Vista	Perm. Easement & Const. Easement	17,200	
SEC Brannan & C.P. Kelly	Parking Lot	3,398	Vacant	M2	3789/27	SBMA Ltd.	Perm. Easement & Const. Easement	2,344	
270 Brannan St.	Parking Lot & "S. Beach Billiards"	37,812	17,350	M2	3774/26	Wuteh of China, Inc.	Perm. Easement & Const. Easement	16,100	
58 Federal St.	Unknown Building	18,162	99,580	M1	3774/74	Augenect San Francisco, Inc.	Permanent Easement	6,300	
355 Bryant St.	Residential Lofts	20,980	NA	NA	3774/75-118	(individually owned condos.)	Permanent Easement	9,100	
Colin P. Kelly Alley	City Street					City	Public ROW Easement		
Sub-Totals		155,275	131,818					51,044	

continued . . .

EXHIBIT 1
CALTRAIN DOWNTOWN STATION RELOCATION STUDY (TASK 5)
PROPERTIES IMPACTED BY SEGMENT

Property Address	Use/ Improvements	Land Sq. Ft.	Bldg. Sq. Ft.	Zoning	Block/ Lot	Ownership	Type of Impact	Sq. Ft. Impacted	Comments
Segment 8									
Bryant St. to Folsom St.	I-80 Ramps Essex Street					CalTrans/ City (Essex St.)	Public ROW Easement		
Sub-Totals		<u>0</u>	<u>0</u>					<u>0</u>	
Segment 9									
530 Howard St.	Unknown Building	5,196	25,955	C3OSD	3721/14	530 Howard St. Assoc. L.P.	Fee Take	25,955	
540 Howard St.	Unknown Building	10,350	46,006	C3OSD	3721/15	Lin Enterprises	Fee Take	46,006	
546 Howard St.	Unknown Building	3,602	3,602 (estimate)	C3OSD	3721/16	KSW Enterprises	Fee Take	3,602	Estimated building area.
55 Natoma (partial lot)	Restaurant	23,750 (total)	Vacant	P	3721/15A (partial)	CalTrans	Fee Take (2)		
Folsom St. to Transbay Terminal	Bus Ramp over Parking Lots					CalTrans	Public ROW Easement		
Sub-Totals		<u>42,898</u>	<u>75,563</u>					<u>75,563</u>	
Segment 10									
701 3rd St.	Restaurant w/ Parking	13,750	1,716	M2	3794/6	Grosvenor Third St. Associates	Permanent Easement	938	
183 Townsend St.		5,153	Vacant	M2	3794/7	183 Townsend Corporation	Permanent Easement	234	
175 Townsend St.	Unknown Building	NA	NA	NA	3794/8	Unknown	Permanent Easement	156	
699 2nd St.	Unknown Building	18,906	24,486	SSO	3789/4	South End Associates	Fee Take	24,488	
64-72 Townsend St.	Unknown Building	29,098	29,098 (est.)	M2	3789/3	McCarthy, John and Son	Fee Take	29,098	Estimated building area

continued

EXHIBIT 1
CALTRAIN DOWNTOWN STATION RELOCATION STUDY (TASK 5)
PROPERTIES IMPACTED BY SEGMENT

Property Address	Use/ Improvements	Land Sq. Ft.	Bldg. Sq. Ft.	Zoning	Block/ Lot	Ownership	Type of Impact	Sq. Ft. Impacted	Comments
Segment 10 (continued)									
SEC Brannan & C.P. Kelly	Parking Lot	3,398	Vacant	M2	3789/27	SBMA Ltd.	Perm. Easement & Const. Easement	2,344	
270 Brannan St.	Parking Lot & "S. Beach Billiards"	37,812	17,350	M2	3774/26	Wuteh of China, Inc.	Perm. Easement & Const. Easement	16,100	
58 Federal St.	Unknown Building	18,162	99,580	M1	3774/74	Augenect San Francisco, Inc.	Permanent Easement	6,300	
355 Bryant St.	Residential Lofts	20,980	NA	NA	3774/75-118	(individually owned condos.)	Permanent Easement	9,100	
Townsend between 3rd St. & 2nd St.	City Street					City	Public ROW Easement		
Colin P. Kelly Alley	City Street					City	Public ROW Easement		
Sub-Totals		147,259	172,230					88,758	
Segment 11									
164 Townsend St.	Unknown Building	16,496	29,025	SLI	3788/11A	Dirk and Barbara Vanmeurs, Trustees	Permanent Easement	30,000	Est. land area of eight easements.
148 Townsend St.	Unknown Building	23,674	45,580	SLI	3788/10	Peggy J. Field Survivors Trust	Permanent Easement		
144 Townsend St.	Unknown Building	16,496	NA	SSO	3788/9A	McCarthy, John and Son	Permanent Easement		
136 Townsend St.	Unknown Building	18,948	NA	SSO	3788/9	John Fox	Permanent Easement		
130 Townsend St.	Unknown Building	22,000	9,600	SSO	3788/8	Gregory and Susan Melanson	Permanent Easement		Also includes small portion of Stanford Alley.
670 2nd St.	Unknown Building	12,104	12,000	SSO	3788/43	Jack Unger	Permanent Easement		

continued

EXHIBIT 1
CALTRAIN DOWNTOWN STATION RELOCATION STUDY (TASK 5)
PROPERTIES IMPACTED BY SEGMENT

Property Address	Use/ Improvements	Land Sq. Ft.	Bldg. Sq. Ft.	Zoning	Block/ Lot	Ownership	Type of Impact	Sq. Ft. Impacted	Comments
Segment 11 (continued)									
650 2nd St.	Unknown Building	10,201	NA	SSO	3788/2A	George Lithograph Company	Permanent Easement		
640 2nd St.	Unknown Building	8,790	NA	SSO	3788/2	640 Second St. Associates	Permanent Easement		
625 2nd St.	Southend Warehouse	35,062	140,252	SSO	3789/7	Southend Associates	Permanent Easement	11,563	Estimated land area of three easements.
601 2nd St.	2nd St. Storage (old brick bldg.)	17,531	105,186	SSO	3789/8	611 Second St. Partners	Permanent Easement		
275 Brannan St.	Unknown Building	17,557	52,182	SSO	3789/9	Ringrose Corporation	Permanent Easement		
599 2nd Street	Retail building w/ parking	16,000	30,480	M2	3774/31,63	Phoenix Industries	Permanent Easement	30,000	Est. land area of five easements.
274 Brannan St.	Unknown Building	22,525	102,933	M2	3774/73	Hawley Terminal, Inc.	Permanent Easement		
77 Federal Way	Unknown Building	26,047 (total)	27,014 (total)	M1	3774/70-72	Plant Properties Incorporated	Permanent Easement		
58 Federal St.	Unknown Building	18,162	99,580	M1	3774/74	Augenect San Francisco, Inc.	Permanent Easement		Also includes small portion of alley and Federal Street.
355 Bryant St.	Residential Lofts	20,980	NA	NA	3774/75-118	(individually owned condos.)	Permanent Easement		
Townsend St., East of 3rd St.	City Street					City	Public ROW Easement		
Sub-Totals		302,573	653,832					71,563	

Notes:

- (1) Portion not included in aerial photographs; thus, information is not available.
 (2) Although ICF Kaiser has identified these parcels as fee takes, the land parcels are owned by the State of California for CalTrans. It is likely that the restaurants will be bought out and permanent subsurface easements will be procured from CalTrans.

Sources: ICF Kaiser; De Leuw, Cather & Company; TRW, Sedway & Associates.
 [d:\r\d\30634\caltrm]

09/28/95

TABLE : SEG - STANDARD ADDONS AT SEGMENT LVL

DESCRIPTION	%	ENGRG. %	CONTIN %	ESCAL. %	RESERV %
ROUTE LENGTH					
TRACK LENGTH					
SITE MODIFICATIONS:					
-DEMOLITION	25.0	40.0			8.0
-UTILITY RELOCATIONS/MODIFICATIONS	25.0	30.0			8.0
-STREET AND ROAD MODIFICATIONS	25.0	40.0			8.0
-RAILROAD MODIFICATIONS	25.0	40.0			8.0
-STRUCTURE MODIFICATIONS	25.0	30.0			8.0
-UNDERPINNING	25.0	30.0			8.0
-ENVIRONMENTAL MITIGATIONS	25.0	25.0			8.0
TRACKWAY - AERIAL	25.0	20.0			8.0
TRACKWAY - AT GRADE	25.0	30.0			8.0
TRACKWAY - RETAINED CUT	25.0	20.0			8.0
SUBWAY:	25.0	20.0			8.0
-CUT AND COVER (SPTC WALLS), 2-TRACK	25.0	20.0			8.0
-CUT AND COVER (SPTC WALLS), 4-TRACK	25.0	20.0			8.0
-CUT AND COVER (SOIL-CEMENT WALLS)	25.0	20.0			8.0
-CUT AND COVER (MESH/ROCK BOLTS)	25.0	20.0			8.0
-MINED TUNNEL & SPECIAL CONSTRUCTION	36.0	20.0			8.0
STATION - STRUCT/FINISH, APPROX. 1,100'	25.0	20.0			8.0
TRACKWORK - BALLASTED	25.0	15.0			8.0
TRACKWORK - DIRECT FIXATION	25.0	15.0			8.0
SPECIAL TRACKWORK, TURNOUTS, ETC.	25.0	20.0			8.0
TRACTION POWER SYSTEM (SYS WIDE)	25.0	25.0			8.0
SIGNALING - WAYSIDE AND STATION	25.0	25.0			8.0
COMMUNICATIONS (SYSTEM WIDE)	25.0	25.0			8.0
YARDS & SHOPS (SYSTEM WIDE)	25.0	25.0			8.0
ROLLING STOCK (SYSTEM WIDE)	3.0	10.0			3.0
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	10.0	25.0			8.0
DIESEL LOCOMOTIVE SALVAGE					
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	25.0	30.0			8.0
RIGHT OF WAY & RELOCATION	10.0	25.0			8.0
ENGINEERING & MANAGEMENT		20.0			8.0
CONTINGENCY					8.0
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					

TABLE : SEG TT - ADDONS AT SEG LVL TTT & BUS

DESCRIPTION	%	ENGRG. %	CONTIN %	ESCAL. %	RESERV %
ROUTE LENGTH					
TRACK LENGTH					
SITE MODIFICATIONS:					
-DEMOLITION		25.0	25.0		8.0
-UTILITY RELOCATIONS/MODIFICATIONS		25.0	40.0		8.0
-STREET AND ROAD MODIFICATIONS		25.0	40.0		8.0
-RAILROAD MODIFICATIONS		25.0	40.0		8.0
-STRUCTURE MODIFICATIONS		25.0	30.0		8.0
-UNDERPINNING		25.0	30.0		8.0
-ENVIRONMENTAL MITIGATIONS		25.0	30.0		8.0
TRACKWAY - AERIAL		25.0	20.0		8.0
TRACKWAY - AT GRADE		25.0	30.0		8.0
TRACKWAY - RETAINED CUT		25.0	20.0		8.0
SUBWAY:		25.0	20.0		8.0
-CUT AND COVER (SPTC WALLS), 2-TRACK		25.0	20.0		8.0
-CUT AND COVER (SPTC WALLS), 4-TRACK		25.0	20.0		8.0
-CUT AND COVER (SOIL-CEMENT WALLS)		25.0	20.0		8.0
-CUT AND COVER (MESH/ROCK BOLTS)		25.0	20.0		8.0
-MINED TUNNEL & SPECIAL CONSTRUCTION		36.0	20.0		8.0
TERMINAL - STRUCT/FINISH, APPROX. 1,100'		25.0	30.0		8.0
TRACKWORK - BALLASTED		25.0	15.0		8.0
TRACKWORK - DIRECT FIXATION		25.0	15.0		8.0
SPECIAL TRACKWORK, TURNOUTS, ETC.		25.0	25.0		8.0
TRACTION POWER SYSTEM (SYS WIDE)		25.0	25.0		8.0
SIGNALING - WAYSIDE AND STATION		25.0	25.0		8.0
COMMUNICATIONS (SYSTEM WIDE)		25.0	25.0		8.0
YARDS & SHOPS (SYSTEM WIDE)		25.0	25.0		8.0
ROLLING STOCK (SYSTEM WIDE)		3.0	10.0		3.0
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)		10.0	25.0		8.0
DIESEL LOCOMOTIVE SALVAGE					
PARK & RIDE LOTS & ACCESS IMPROVEMENTS		25.0	30.0		8.0
RIGHT OF WAY & RELOCATION		10.0	25.0		8.0
ENGINEERING & MANAGEMENT			25.0		8.0
CONTINGENCY					8.0
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					

SEGMENT: 1A - 7TH & 16TH TO 3RD & TOWNSEND S

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTINGENCY
SYSTEM DATA					
ROUTE LENGTH	RF	3950.0			
TRACK LENGTH	TF	8700.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3950.0	395	40.0	158
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3950.0	8619	30.0	2586
-STREET AND ROAD MODIFICATIONS	RF	3950.0	494	40.0	198
-RAILROAD MODIFICATIONS	LS	1.0	1000	40.0	400
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	500	25.0	125
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	1640.0	164	30.0	49
TRACKWAY - RETAINED CUT	RF	920.0	7416	20.0	1483
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1390.0	28894	20.0	5779
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF	3280.0	433	15.0	65
TRACKWORK - DIRECT FIXATION	TF	5420.0	1247	15.0	187
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350	20.0	70
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$49512		\$11100
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1751	25.0	438
ENGINEERING & MANAGEMENT			12553	20.0	2511
Subtotal NON-CONSTRUCTION COSTS :			\$14304		\$2948
CONTINGENCY					
CONTINGENCY			14048		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			6229		
Subtotal :			\$84093		\$14048



SEGMENT: 1B - 7TH & 16TH TO 3RD & TOWNSEND D

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGH	RF	4780.0			
TRACK LENGH	TF	10360.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	4780.0	478	40.0	191
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4780.0	13107	30.0	3932
-STREET AND ROAD MODIFICATIONS	RF	4780.0	1147	40.0	459
-RAILROAD MODIFICATIONS	LS	1.0	1000	40.0	400
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	500	25.0	125
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	150.0	15	30.0	5
TRACKWAY - RETAINED CUT	RF	680.0	5481	20.0	1096
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS) , 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS) , 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3950.0	82110	20.0	16422
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF	300.0	40	15.0	6
TRACKWORK - DIRECT FIXATION	TF	10060.0	2314	15.0	347
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350	20.0	70
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$106542		\$23053
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1851	25.0	463
ENGINEERING & MANAGEMENT			26821	20.0	5364
Subtotal NON-CONSTRUCTION COSTS :			\$28672		\$5827
CONTINGENCY					
CONTINGENCY			28880		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			13128		
Subtotal :			\$177222		\$28880

SEGMENT: 2 - MINED TUNNEL, 3RD ST TO FOLSOM

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	2720.0			
TRACK LENGTH	TF	5440.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	2720.0	272	40.0	109
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2720.0	495	30.0	149
-STREET AND ROAD MODIFICATIONS	RF	2720.0	90	40.0	36
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0	1500	30.0	450
-ENVIRONMENTAL MITIGATIONS	LS	1.0		25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUEWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	550.0	10210	20.0	2042
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	2170.0	57411	20.0	11482
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	5440.0	1251	15.0	188
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$71229		\$14455
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3823	25.0	956
ENGINEERING & MANAGEMENT			24505	20.0	4901
Subtotal NON-CONSTRUCTION COSTS :			\$28328		\$5857
CONTINGENCY					
CONTINGENCY			20312		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			9590		
Subtotal :			\$129459		\$20312

SEGMENT: 3AC - MARKET/BEALE VIA C & C

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	3559.0			
TRACK LENGTH	TF	15836.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3559.0	712	40.0	285
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3559.0	14400	30.0	4320
-STREET AND ROAD MODIFICATIONS	RF	3559.0	2135	40.0	854
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS	1.0	5000	30.0	1500
-UNDERPINNING	LS	1.0	3000	30.0	900
-ENVIRONMENTAL MITIGATIONS	LS	1.0	1500	25.0	375
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF	1120.0	74683	20.0	14937
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1234.0	33514	20.0	6703
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	125.0	15487	20.0	3097
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	115280	20.0	23056
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	15836.0	3642	15.0	546
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	850	20.0	170
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$270203		\$56743
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	7302	25.0	1826
ENGINEERING & MANAGEMENT			69985	20.0	13997
Subtotal NON-CONSTRUCTION COSTS :			\$77287		\$15823
CONTINGENCY					
CONTINGENCY			72565		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			33604		
Subtotal :			\$453659		\$72565

SEGMENT: 3AM - MARKET/BEALE VIA MINED TUNNEL

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GECY
SYSTEM DATA					
ROUTE LENGH	RF	3030.0			
TRACK LENGH	TF	13560.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3030.0	606	40.0	242
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3030.0	13690	30.0	4107
-STREET AND ROAD MODIFICATIONS	RF	3030.0	1818	40.0	727
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS	1.0	5000	30.0	1500
-UNDERPINNING	LS	1.0	2000	30.0	600
-ENVIRONMENTAL MITIGATIONS	LS	1.0	1500	25.0	375
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS) , 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS) , 4-TRACK	RF	1120.0	68803	20.0	13761
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	150.0	4718	20.0	944
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	680.0	35981	20.0	7196
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	117070	20.0	23414
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	13560.0	3119	15.0	468
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	850	20.0	170
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$255155		\$53504
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	10535	25.0	2634
ENGINEERING & MANAGEMENT			68800	20.0	13760
Subtotal NON-CONSTRUCTION COSTS :			\$79335		\$16394
CONTINGENCY					
CONTINGENCY			69898		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			32351		
Subtotal :			\$436739		\$69898

SEGMENT: 3BC - MARKET/BEALE STAGGERED C&C

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	3515.0			
TRACK LENGTH	TF	10230.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3515.0	703	40.0	281
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3515.0	13216	30.0	3965
-STREET AND ROAD MODIFICATIONS	RF	3515.0	2004	40.0	802
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS	1.0	5500	30.0	1650
-UNDERPINNING	LS	1.0	2500	30.0	750
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2400	25.0	600
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1150.0	28073	20.0	5615
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1215.0	22555	20.0	4511
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	99266	20.0	19853
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	10230.0	2353	15.0	353
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	435	20.0	87
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$179005		\$38466
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	7302	25.0	1826
ENGINEERING & MANAGEMENT			45481	20.0	9096
Subtotal NON-CONSTRUCTION COSTS :			\$52783		\$10922
CONTINGENCY					
CONTINGENCY			49388		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			22494		
Subtotal :			\$303670		\$49388

SEGMENT: 3BM - MARKET/BEALE STAGGERED MINED

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGIH	RF	3030.0			
TRACK LENGIH	TF	10060.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3030.0	606	40.0	242
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3030.0	12505	30.0	3752
-STREET AND ROAD MODIFICATIONS	RF	3030.0	1430	40.0	572
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS	1.0	5500	30.0	1650
-UNDERPINNING	LS	1.0	2000	30.0	600
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2400	25.0	600
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS) , 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS) , 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1150.0	28073	20.0	5615
-CUT AND COVER (MESH/ROCK BOLTS)	RF	150.0	2785	20.0	557
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	680.0	17990	20.0	3598
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	99266	20.0	19853
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	10060.0	2314	15.0	347
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	435	20.0	87
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$175304		\$37473
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	10535	25.0	2634
ENGINEERING & MANAGEMENT			46858	20.0	9372
Subtotal NON-CONSTRUCTION COSTS :			\$57393		\$12005
CONTINGENCY					
CONTINGENCY			49478		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			22574		
Subtotal :			\$304749		\$49478

SEGMENT: 3CC - MISSION/FOLSOM C & C

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENY
SYSTEM DATA					
ROUTE LENGTH	RF	2945.0			
TRACK LENGTH	TF	9790.0			
CONSTRUCTION COSTS					
STIE MODIFICATIONS:					
-DEMOLITION	RF	2945.0	589	40.0	236
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2945.0	10682	30.0	3205
-STREET AND ROAD MODIFICATIONS	RF	2945.0	1384	40.0	554
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS	1.0	500	30.0	150
-UNDERPINNING	LS	1.0	2500	30.0	750
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2400	25.0	600
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	510.0	12450	20.0	2490
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1315.0	24412	20.0	4882
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	95197	20.0	19039
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	9790.0	2252	15.0	338
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	435	20.0	87
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$152801		\$32330
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	302	25.0	76
ENGINEERING & MANAGEMENT			38230	20.0	7646
Subtotal NON-CONSTRUCTION COSTS :			\$38532		\$7722
CONTINGENCY					
CONTINGENCY			40052		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			18511		
Subtotal :			\$249896		\$40052

SEGMENT: 3CM - MISSION/FOLSOM MINED

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	2420.0			
TRACK LENGTH	TF	8820.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	2420.0	484	40.0	194
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2420.0	9968	30.0	2990
-STREET AND ROAD MODIFICATIONS	RF	2420.0	937	40.0	375
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS	1.0	500	30.0	150
-UNDERPINNING	LS	1.0	2000	30.0	600
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2400	25.0	600
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	570.0	13914	20.0	2783
-CUT AND COVER (MESH/ROCK BOLTS)	RF	150.0	2785	20.0	557
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	680.0	17990	20.0	3598
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	95197	20.0	19039
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	8820.0	2029	15.0	304
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	435	20.0	87
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$148639		\$31277
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3535	25.0	884
ENGINEERING & MANAGEMENT			39492	20.0	7898
Subtotal NON-CONSTRUCTION COSTS :			\$43027		\$8782
CONTINGENCY					
CONTINGENCY			40060		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			18538		
Subtotal :			\$250264		\$40060

SEGMENT: 4 - 3RD & TOWNSEND TO DELANCEY ST.

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	1830.0			
TRACK LENGTH	TF	4460.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1830.0	275	40.0	110
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1830.0	2921	30.0	876
-STREET AND ROAD MODIFICATIONS	RF	1830.0	615	40.0	246
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	150	25.0	38
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	580.0	12278	20.0	2456
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1250.0	23850	20.0	4770
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	4460.0	1026	15.0	154
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$41115		\$8649
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	447	25.0	112
ENGINEERING & MANAGEMENT			10323	20.0	2065
Subtotal NON-CONSTRUCTION COSTS :			\$10770		\$2176
CONTINGENCY					
CONTINGENCY			10826		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			5017		
Subtotal :			\$67728		\$10826

SEGMENT: 5 - DELANCEY ST. TO FOLSOM ST.

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGH	RF	1301.0			
TRACK LENGH	TF	2602.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1301.0	130	40.0	52
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1301.0	610	30.0	183
-STREET AND ROAD MODIFICATIONS	RF	1301.0	388	40.0	155
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1301.0	27541	20.0	5508
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	2602.0	598	15.0	90
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$29267		\$5988
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	2666	25.0	667
ENGINEERING & MANAGEMENT			7583	20.0	1517
Subtotal NON-CONSTRUCTION COSTS :			\$10249		\$2183
CONTINGENCY					
CONTINGENCY			8171		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			3815		
Subtotal :			\$51502		\$8171

SEGMENT: 6A - 7TH & 16TH TO 2ND & KING SHORT

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	5245.0			
TRACK LENGTH	TF	11290.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	5245.0	525	40.0	210
-UTILITY RELOCATIONS/MODIFICATIONS	RF	5245.0	11083	30.0	3325
-STREET AND ROAD MODIFICATIONS	RF	5245.0	3147	40.0	1259
-RAILROAD MODIFICATIONS	LS	1.0	500	40.0	200
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	540	25.0	135
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	980.0	98	30.0	29
TRACKWAY - RETAINED CUT	RF	1165.0	10716	20.0	2143
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3100.0	56755	20.0	11351
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF	1960.0	259	15.0	39
TRACKWORK - DIRECT FIXATION	TF	9330.0	2146	15.0	322
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350	20.0	70
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$86119		\$19083
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			21530	20.0	4306
Subtotal NON-CONSTRUCTION COSTS :			\$21530		\$4306
CONTINGENCY					
CONTINGENCY			23389		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			10483		
Subtotal :			\$141521		\$23389

SEGMENT: 6AX - 6A SEGMENT CUT BACK TO 3RD ST

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGH	RF	4445.0			
TRACK LENGH	TF	9690.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	4445.0	445	40.0	178
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4445.0	9392	30.0	2818
-STREET AND ROAD MODIFICATIONS	RF	4445.0	2667	40.0	1067
-RAILROAD MODIFICATIONS	LS	1.0	500	40.0	200
-SIRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	540	25.0	135
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	980.0	98	30.0	29
TRACKWAY - RETAINED CUT	RF	1165.0	10716	20.0	2143
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	2300.0	42109	20.0	8422
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF	1960.0	259	15.0	39
TRACKWORK - DIRECT FIXATION	TF	7730.0	1778	15.0	267
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350	20.0	70
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$68854		\$15367
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			17214	20.0	3443
Subtotal NON-CONSTRUCTION COSTS :			\$17214		\$3443
CONTINGENCY					
CONTINGENCY			18810		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			8390		
Subtotal :			\$113268		\$18810

SEGMENT: 6B - 7TH & 16TH TO 2ND & KING DEEP

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	5330.0			
TRACK LENGTH	TF	11460.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	5330.0	533	40.0	213
-UTILITY RELOCATIONS/MODIFICATIONS	RF	5330.0	14332	30.0	4300
-STREET AND ROAD MODIFICATIONS	RF	5330.0	3198	40.0	1279
-RAILROAD MODIFICATIONS	LS	1.0	500	40.0	200
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	540	25.0	135
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	150.0	15	30.0	5
TRACKWAY - RETAINED CUT	RF	680.0	6448	20.0	1290
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	4500.0	88394	20.0	17679
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF	300.0	40	15.0	6
TRACKWORK - DIRECT FIXATION	TF	10860.0	2498	15.0	375
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350	20.0	70
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$116848		\$25551
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			29212	20.0	5842
Subtotal NON-CONSTRUCTION COSTS :			\$29212		\$5842
CONTINGENCY					
CONTINGENCY			31393		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			14196		
Subtotal :			\$191649		\$31393

SEGMENT: 6BX - 6B SEGMENT CUT BACK TO 3RD ST

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	4530.0			
TRACK LENGTH	TF	10660.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	4530.0	453	40.0	181
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4530.0	12181	30.0	3654
-STREET AND ROAD MODIFICATIONS	RF	4530.0	2718	40.0	1087
-RAILROAD MODIFICATIONS	LS	1.0	500	40.0	200
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	540	25.0	135
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	150.0	15	30.0	5
TRACKWAY - RETAINED CUT	RF	680.0	6448	20.0	1290
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3700.0	72680	20.0	14536
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF	300.0	40	15.0	6
TRACKWORK - DIRECT FIXATION	TF	9260.0	2130	15.0	320
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	350	20.0	70
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$98055		\$21483
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			24514	20.0	4903
Subtotal NON-CONSTRUCTION COSTS :			\$24514		\$4903
CONTINGENCY					
CONTINGENCY			26386		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			11916		
Subtotal :			\$160871		\$26386

SEGMENT: 7 - 2ND & KING TO BRANNAN & COLIN

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	1885.0			
TRACK LENGTH	TF	3770.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1885.0	189	40.0	76
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1885.0	424	30.0	127
-STREET AND ROAD MODIFICATIONS	RF	1885.0	60	40.0	24
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0	300	30.0	90
-ENVIRONMENTAL MITIGATIONS	LS	1.0	130	25.0	33
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	1550.0	31439	20.0	6288
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	335.0	8863	20.0	1773
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	3770.0	910	15.0	137
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$42315		\$8546
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	289	25.0	72
ENGINEERING & MANAGEMENT			11583	20.0	2317
Subtotal NON-CONSTRUCTION COSTS :			\$11872		\$2389
CONTINGENCY					
CONTINGENCY			10935		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			5210		
Subtotal :			\$70332		\$10935

SEGMENT: 8 - BRANNAN & COLIN P. TO FOLSOM

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	1065.0			
TRACK LENGTH	TF	2130.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1065.0	144	30.0	43
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	1065.0	28176	20.0	5635
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	2130.0	490	15.0	74
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$28810		\$5752
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			10302	20.0	2060
Subtotal NON-CONSTRUCTION COSTS :			\$10302		\$2060
CONTINGENCY					
CONTINGENCY			7812		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			3754		
Subtotal :			\$50678		\$7812

SEGMENT: 9A - NEW - ABOVE GROUND T.T.T.

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGH	RF	2405.0			
TRACK LENGH	TF	8550.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	7762	25.0	1941
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2405.0	498	40.0	199
-STREET AND ROAD MODIFICATIONS	RF	2405.0	241	40.0	96
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2000	30.0	600
TRACKWAY - AERIAL	RF	670.0	4824	20.0	965
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF	300.0	2845	20.0	569
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	250.0	4641	20.0	928
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	60775	30.0	18233
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	8550.0	1967	15.0	295
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	410	25.0	103
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$85963		\$23928
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	4500	25.0	1125
ENGINEERING & MANAGEMENT			21941	25.0	5485
Subtotal NON-CONSTRUCTION COSTS :			\$26441		\$6610
CONTINGENCY					
CONTINGENCY			30538		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			11435		
Subtotal :			\$154377		\$30538

SEGMENT: 9B - NEW - C&C TTT, VIA C.P. KELLY

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGH	RF	2405.0			
TRACK LENGH	TF	8550.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	7762	25.0	1941
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2405.0	1854	40.0	742
-STREET AND ROAD MODIFICATIONS	RF	2405.0	241	40.0	96
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0		30.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2790	30.0	837
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	870.0	16151	20.0	3230
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	350.0	9260	20.0	1852
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	82382	30.0	24715
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	8550.0	1967	15.0	295
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	410	25.0	103
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$122817		\$33810
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	4500	25.0	1125
ENGINEERING & MANAGEMENT			32173	25.0	8043
Subtotal NON-CONSTRUCTION COSTS :			\$36673		\$9168
CONTINGENCY					
CONTINGENCY			42978		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			16197		
Subtotal :			\$218665		\$42978

SEGMENT: 10 - 3RD AND TOWNSEND TO BRANNAN

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGIH	RF	2380.0			
TRACK LENGIH	TF	4760.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	2380.0	238	40.0	95
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2380.0	2787	30.0	836
-STREET AND ROAD MODIFICATIONS	RF	2380.0	714	40.0	286
-RAILROAD MODIFICATIONS	LS			40.0	
-SIRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0	1000	30.0	300
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUEWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF	2045.0	39721	20.0	7944
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	335.0	8863	20.0	1773
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATTION	TF	4760.0	1095	15.0	164
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$54418		\$11398
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1991	25.0	498
ENGINEERING & MANAGEMENT			14779	20.0	2956
Subtotal NON-CONSTRUCTION COSTS :			\$16770		\$3454
CONTINGENCY					
CONTINGENCY			14852		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			6883		
Subtotal :			\$92923		\$14852

SEGMENT: 11 - MINED TUNNEL -3RD TO C.P.KELLY

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGH	RF	2148.0			
TRACK LENGH	TF	4296.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	2148.0	496	30.0	149
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0	1000	30.0	300
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF	2148.0	56829	20.0	11366
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	4296.0	988	15.0	148
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$59313		\$11963
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	80	25.0	20
ENGINEERING & MANAGEMENT			21087	20.0	4217
Subtotal NON-CONSTRUCTION COSTS :			\$21167		\$4237
CONTINGENCY					
CONTINGENCY			16200		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			7734		
Subtotal :			\$104414		\$16200

SEGMENT: 12 - CUT & COVER, EMBARCADERO

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	988.0			
TRACK LENGTH	TF	1976.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	988.0	148	40.0	59
-UTILITY RELOCATIONS/MODIFICATIONS	RF	988.0	463	30.0	139
-STREET AND ROAD MODIFICATIONS	RF	988.0	445	40.0	178
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	988.0	22234	20.0	4447
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	1976.0	454	15.0	68
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$23744		\$4891
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			5936	20.0	1187
Subtotal NON-CONSTRUCTION COSTS :			\$5936		\$1187
CONTINGENCY					
CONTINGENCY			6078		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			2861		
Subtotal :			\$38619		\$6078

SEGMENT: SW1 - TRACTION POWER, DWTN SF GILROY

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GNCY
SYSTEM DATA					
ROUTE LENGIH	RF				
TRACK LENGIH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	55480	25.0	13870
SIGNALING - WAYSIDE AND STATION	LS	1.0	20100	25.0	5025
COMMUNICATIONS (SYSTEM WIDE)	TF	1.0	300	25.0	75
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	500	25.0	125
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$76380		\$19095
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			19095	20.0	3819
Subtotal NON-CONSTRUCTION COSTS :			\$19095		\$3819
CONTINGENCY					
CONTINGENCY			22914		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			9471		
Subtotal :			\$127860		\$22914

SEGMENT: SW2 - TRACTION POWER, IRWIN TO DWTN

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	2919	25.0	730
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	500	25.0	125
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$3419		\$855
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			855	20.0	171
Subtotal NON-CONSTRUCTION COSTS :			\$855		\$171
CONTINGENCY					
CONTINGENCY			1026		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			424		
Subtotal :			\$5724		\$1026

SEGMENT: SW3 - SATELLITE YARD (16TH /I-280)

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF	12060.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	500	40.0	200
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	47	30.0	14
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS	1.0	500	40.0	200
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF	12060.0	1869	15.0	280
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	595	20.0	119
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	3702	25.0	926
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$7213		\$1739
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1000	25.0	250
ENGINEERING & MANAGEMENT			1903	20.0	381
Subtotal NON-CONSTRUCTION COSTS :			\$2903		\$631
CONTINGENCY					
CONTINGENCY			2370		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			999		
Subtotal :			\$13485		\$2370

SEGMENT: SW4 - SATELLITE YARD (BAYSHORE)

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF	12010.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS	1.0	200	40.0	80
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF	12010.0	1862	15.0	279
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	720	20.0	144
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	2891	25.0	723
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$5673		\$1226
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			1418	20.0	284
Subtotal NON-CONSTRUCTION COSTS :			\$1418		\$284
CONTINGENCY					
CONTINGENCY			1510		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			688		
Subtotal :			\$9289		\$1510

SEGMENT: SW5 - LNG FUELING FACILITIES

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	2000	25.0	500
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$2000		\$500
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			500	20.0	100
Subtotal NON-CONSTRUCTION COSTS :			\$500		\$100
CONTINGENCY					
CONTINGENCY			600		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			248		
Subtotal :			\$3348		\$600

SEGMENT: SW6 - NEW ELECTRIC LOCO'S, VENT CRED

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GECY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF	1.0	-6400	20.0	-1280
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	-6700	20.0	-1340
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA	23.0	108100	10.0	10810
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA	23.0	-23000		
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$72000		\$8190
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			-32	20.0	-6
Subtotal NON-CONSTRUCTION COSTS :			\$-32		\$-6
CONTINGENCY					
CONTINGENCY			8184		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			2847		
Subtotal :			\$82999		\$8184

SEGMENT: SW6X - NEW ELECTRIC LOCO'S (BARE)

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA	23.0	108100	10.0	10810
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA	23.0	-23000		
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$85100		\$10810
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			3243	20.0	649
Subtotal NON-CONSTRUCTION COSTS :			\$3243		\$649
CONTINGENCY					
CONTINGENCY			11459		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			4419		
Subtotal :			\$104221		\$11459

SEGMENT: SW7 - DUAL-MODE LOCO'S, VENT CREDIT

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF	1.0	-6400	20.0	-1280
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	-6700	20.0	-1340
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA	23.0	161000	10.0	16100
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA	23.0	-23000		
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$124900		\$13480
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			1555	20.0	311
Subtotal NON-CONSTRUCTION COSTS :			\$1555		\$311
CONTINGENCY					
CONTINGENCY			13791		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			5010		
Subtotal :			\$145256		\$13791

SEGMENT: SW7X - DUAL-MODE LOCO'S, BARE

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPIC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA	23.0	161000	10.0	16100
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA	23.0	-23000		
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$138000		\$16100
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			4830	20.0	966
Subtotal NON-CONSTRUCTION COSTS :			\$4830		\$966
CONTINGENCY					
CONTINGENCY			17066		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			6582		
Subtotal :			\$166478		\$17066

SEGMENT: SW8 - LOCO UPGRADE TO LNG, VENT CRED

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGH	RF				
TRACK LENGH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF	1.0	-6000	20.0	-1200
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA	1.0	-800	20.0	-160
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA	23.0	6440	25.0	1610
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$-360		\$250
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			-1056	20.0	-211
Subtotal NON-CONSTRUCTION COSTS :			\$-1056		\$-211
CONTINGENCY					
CONTINGENCY			39		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			-110		
Subtotal :			\$-1487		\$39

SEGMENT: SW8X - EXIST LOCO UPGRADE TO LNG BARE

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA	23.0	6440	25.0	1610
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$6440		\$1610
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			644	20.0	129
Subtotal NON-CONSTRUCTION COSTS :			\$644		\$129
CONTINGENCY					
CONTINGENCY			1739		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			706		
Subtotal :			\$9529		\$1739

SEGMENT: SW9 - CLEAN DIESEL LOCO. UPGRADE

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGH	RF				
TRACK LENGH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-SIRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS) , 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA			10.0	
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA	23.0	2875	25.0	719
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$2875		\$719
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			288	20.0	58
Subtotal NON-CONSTRUCTION COSTS :			\$288		\$58
CONTINGENCY					
CONTINGENCY			776		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			315		
Subtotal :			\$4254		\$776

SEGMENT: SW10 - MISC. SYSTEM WIDE ELEMENTS

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN- GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			40.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			30.0	
-STREET AND ROAD MODIFICATIONS	RF			40.0	
-RAILROAD MODIFICATIONS	LS			40.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			30.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF			20.0	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SPTC WALLS), 4-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL & SPECIAL CONSTRUCTION	RF			20.0	
TERMINAL - STRUCT/FINISH, APPROX. 1,100'	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			20.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			25.0	
SIGNALING - WAYSIDE AND STATION	LS	1.0	3376	25.0	844
COMMUNICATIONS (SYSTEM WIDE)	TF	1.0	6639	25.0	1660
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
ROLLING STOCK (SYSTEM WIDE)	EA	25.0	45000	10.0	4500
LOCOMOTIVE CONVERSION/UPGRADE (SYS WIDE)	EA			25.0	
DIESEL LOCOMOTIVE SALVAGE	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			\$55015		\$7004
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			3854	20.0	771
Subtotal NON-CONSTRUCTION COSTS :			\$3854		\$771
CONTINGENCY					
CONTINGENCY			7775		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			3082		
Subtotal :			\$69726		\$7775



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SEGMENT COMPOSITION OF ALTERNATIVES

09/22/95
BY BCC/RLM

PRIMARY ALTERNATIVES

ALT NO.	ALIGNMENT SEGMENTS												SYSTEMWIDE																		
	1A	1B	2	3AC	3AM	3BC	3BM	3CC	3CM	4	5	6A	6B	7	6	9A	9B	10	11	12	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10	
1																															
2A-CTD	X			X						X	X												X						X	X	
2A-MTD	X		X		X																		X						X	X	
2B-CTD	X					X				X	X												X						X	X	
2B-MTD	X		X				X																X						X	X	
2C-CTD	X							X		X	X												X						X	X	
2C-MTD	X		X						X														X						X	X	
3A-CTD	X														X	X	X	X					X						X	X	
3A-MTD	X														X	X	X		X				X						X	X	
3B-CTD	X														X	X	X	X					X						X	X	
3B-MTD	X														X	X	X		X				X						X	X	

— D = DIESEL LOCOMOTIVES, G = LNG LOCOMOTIVES, M = DUAL MODE LOCOMOTIVES E = ELECTRIC LOCOMOTIVES

— T = TOWNSEND STREET ALIGNMENT, K = KING STREET ALIGNMENT

— C = CUT AND COVER ALIGNMENT, M = MINED TUNNEL ALIGNMENT

A,B,C = TERMINAL CONFIGURATION OPTIONS

1 = FOURTH AND TOWNSEND TERMINAL LOCATION (NO BUILD), 2 = MARKET/BEALE TERMINAL LOCATION, 3 = TRANSBAY TERMINAL LOCATION



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CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.

SEGMENT DEFINITION TABLE

09/27/95
BY BCC/RLM

SEGMENT DESCRIPTION	SEGMENT NUMBER	STARTING STATION	ENDING STATION	TURNOUTS	ROUTE FEET (RF)	TRACK FEET (TF)
APPROX. IRWIN & SEVENTH TO APPROX. THIRD & TOWNSEND VIA CUT - AND - COVER CONSTRUCTION. PORTAL ON TOWNSEND BETWEEN FIFTH AND FOURTH.	1A	130+00	169+50	4	3,950'	8,700'
APPROX. IRWIN & SEVENTH TO APPROX. THIRD & TOWNSEND VIA CUT - AND - COVER CONSTRUCTION. PORTAL ON SEVENTH NEAR BERRY.	1B	121+70	169+50	4	4,780'	10,360'
APPROX. THIRD & TOWNSEND TO BRYANT VIA MINED TUNNEL CONSTRUCTION.	2	169+50	196+70	0	2,720'	5,440'
APPROX. BEALE AND BRYANT TO A THREE LEVEL CENTER PLATFORM UNDERGROUND (CUT - AND - COVER) TERMINAL AT MARKET/BEALE.	3AC	200+81	236+40	8	3,559'	15,836'
APPROX. BRYANT TO A THREE LEVEL SIDE PLATFORM UNDERGROUND (CUT - AND - COVER) TERMINAL AT MARKET/BEALE.	3AM	196+70	227+00	8	3,030'	13,560'
APPROX. BEALE AND BRYANT TO A TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT - AND - COVER) STAGGERED TERMINAL AT MARKET/BEALE.	3BC	200+81 197+54 STA 206+50 BK = 197+54 AHD	206+50 227+00	4	3,515'	10,230'
APPROX. BRYANT ST. TO A TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT - AND - COVER) STAGGERED TERMINAL AT MARKET/BEALE.	3BM	196+70	227+00	4	3,030'	10,060'
APPROX. BEALE AND BRYANT TO A TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT - AND - COVER) TERMINAL BETWEEN MISSION AND FOLSOM.	3CC	200+81 197+54 STA 206+50 BK = 197+54 AHD	206+50 220+90	4	2,945'	9,790'
APPROX. BRYANT ST. TO A TWO LEVEL CENTER PLATFORM UNDERGROUND (CUT - AND - COVER) TERMINAL BETWEEN MISSION AND FOLSOM.	3CM	196+70	220+90	4	2,420'	8,820'
APPROX. THIRD AND TOWNSEND TO DELANCY AND TOWNSEND, VIA CUT - AND - COVER CONSTRUCTION.	4	169+50	187+80	0	1,830'	4,460'



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SEGMENT DEFINITION TABLE

09/27/95
BY BCC/RLM

SEGMENT DESCRIPTION	SEGMENT NUMBER	STARTING STATION	ENDING STATION	TURNOUTS	ROUTE FEET (RF)	TRACK FEET (TF)
APPROX. DELANCY AND EMBARCADERO TO BRYANT AND BEALE, VIA CUT – AND – COVER UNDER THE EMBARCADERO	5	187+80	200+81	0	1,301'	2,602'
APPROX. IRWIN & SEVENTH TO APPROX. SECOND & KING VIA CUT – AND – COVER CONSTRUCTION. PORTAL ON KING 400' EAST OF SIXTH ST.	6A	122+55	175+00	4	5,245'	11,290'
APPROX. IRWIN & SEVENTH TO APPROX. 2ND & KING VIA CUT – AND – COVER CONSTRUCTION. PORTAL ON SEVENTH NEAR BERRY.	6B	121+70	175+00	4	5,330'	11,460'
SECOND & KING TO BRYANT & COLIN P. KELLY, VIA COLIN P. KELLY	7	175+00	193+85	0	1,885'	3,770'
BRYANT & COLIN P. KELLY TO FOLSOM PORTAL, VIA MINED TUNNEL CONSTRUCTION.	8	193+85	204+50	0	1,065'	2,130'
FOLSOM PORTAL, AERIAL TO NEW AERIAL TERMINAL ON TRANSBAY SITE	9A	204+50	228+55	6	2,405'	8,550'
FOLSOM TO NEW UNDERGROUND TERMINAL ON TRANSBAY SITE	9B	204+50	228+55	6	2,405'	8,550'
APPROX. THIRD & TOWNSEND TO BRYANT & COLIN P. KELLY, VIA SHORT RADIUS TURN.	10	169+50	178+10	0	2,380'	4,760'
		178+65	193+85			
APPROX. THIRD & TOWNSEND TO BRYANT & COLIN P. KELLY, VIA LONG RADIUS TURN.	11	STA 178+10 BK = 178+75 AHD				4,296'
		169+50	190+98	0	2,148'	
KING AND 2ND TO APPROX. DELANCEY AND THE EMBARCADERO VIA CUT – AND – COVER.	12	STA 190+98 BK = 193+85 AHD				2,416'
		175+00	184+88	0	1,208'	
TRACTION POWER (DWTN SAN FRANCISCO TO GILROY)	SW1	STA 184+88 BK = 187+80 AHD				N/A
		N/A	N/A	N/A	N/A	



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
SEGMENT DEFINITION TABLE

09/27/95
BY BCC/RLM

SEGMENT DESCRIPTION	SEGMENT NUMBER	STARTING STATION	ENDING STATION	TURNOUTS	ROUTE FEET (RF)	TRACK FEET (TF)
TRACTION POWER (DWTN SAN FRANCISCO TO IRWIN)	SW2	N/A	N/A	N/A	N/A	N/A
SATELLITE STORAGE YARD (16TH STREET / I-280)	SW3	N/A	N/A	N/A	N/A	12,060'
SATELLITE STORAGE YARD (BAYSHORE IN BRISBANE)	SW4	N/A	N/A	N/A	N/A	13974'
PULLMAN WAY, SAN JOSE L.N.G. FUELING FACILITY	SW5	N/A	N/A	N/A	N/A	N/A
NEW ELECTRIC LOCOMOTIVES	SW6	N/A	N/A	N/A	N/A	N/A
NEW DUAL - MODE LOCOMOTIVES	SW7	N/A	N/A	N/A	N/A	N/A
DIESEL LOCOMOTIVE CONVERSION TO L.N.G.	SW8	N/A	N/A	N/A	N/A	N/A
CLEAN DIESEL LOCOMOTIVE UPGRADE	SW9	N/A	N/A	N/A	N/A	N/A
MISC. SYSTEM WIDE LELMENTS	SW10	N/A	N/A	N/A	N/A	N/A

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**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE**

9-22-95
By BCC/RLM

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF)										SHORING WALL HEIGHT (ft)		
				STA- TION	BAY BRG. ANCHOR- AGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	Estimate	Site Specific
#1A	Seventh and Berry, to third and Townsend	130+00	169+50													
	AT GRADE, Seventh and Hooper to Townsend and Sixth.	130+00	146+40				1,640'									
	RETAINED CUT, Townsend and Sixth to between Fourth & Fifth on Townsend.	146+40	155+60				920'									
	CUT & COVER from between Fourth and Fifth on Townsend to Third and Townsend.	155+60	169+50					1,390'								
	TOTAL SEGMENT						1,640'	920'	1,390'							
#1B	Seventh and Berry, to third and Townsend	121+70	169+50													
	AT GRADE, Seventh and Hooper to approx. Seventh and Hooper.	121+70	123+20				150'									
	RETAINED CUT, Seventh and Hooper to Seventh and Berry. on Townsend.	123+20	130+00				680'									
	CUT & COVER from between Fourth and Fifth on Townsend to Third and Townsend.	130+00	169+50					3,950'								
	TOTAL SEGMENT						150'	680'	3,950'							
#2	Third and Townsend, to approx. I-80.	169+50	196+70													
	CUT & COVER to portal of mined tunnel.	169+50	175+00								550'					
	TWO TRK MINED TUNNEL	175+00	196+70												2,170'	
	TOTAL SEGMENT										550'				2,170'	



**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE**

9-22-95
By BCC/RLM

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF)										SHORING WALL HEIGHT (ft)		
				STA- TION	BAY BRG. ANCHOR- AGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	Estimate	Site Specific
#3AC	Beale and Bryant, to Market/ Beale Station.	200+81	236+40													
	CUT & COVER TRANS. TWO TRK TO FOUR TRK. Bryant to Bryant on Beale.	200+81	205+44							463'						
	CUT & COVER FOUR TRK from Beale & Bryant to Bay Bridge.	205+44	206+24							80'						
	CUT & COVER FOUR TRK @ Bay Bridge and Beale	206+24	206+94		70'					691'						
	CUT & COVER FOUR TRK @ Bay Bridge and Beale to	206+94	207+49		55'											
	CUT & COVER FOUR TRK @ Bay Bridge to STA 205+00	207+49	214+40													
	CUT & COVER FOUR TRK @ STA 207+29	214+40	216+69													
	CUT & COVER FOUR TRK @ STA 217+00 Extra Wide	216+69	225+60								891'					
	MARKET/BEALE STATION	225+60	236+40	1,080'												
	TOTAL SEGMENT		3,559'	1,080'	125'					1,234		891'	229'			
#3AM	1-80, to Market/Beale Station.	196+70	227+00													
	MINED TUNNEL Four Trk. Width to Beale & Harrison	196+70	203+50											680'		
	CUT & COVER Four Trk. Width @ Harrison to approx. STA 205+00, Rock Bolt	203+50	205+00							150'						
	CUT & COVER Four Trk Width @ Folsom.	205+00	209+79										479'			
	CUT & COVER @ Folsom to	209+79	213+28										349'			

**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE**

9-22-95
By BCC/RLM

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF)										SHORING WALL HEIGHT (ft)	
				STA-TION	BAY BRG. ANCHOR- AGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	Estimate
	to STA 213+28 Trans. to Three Trk. Width CUT & COVER Sta 213+28 to Market/Beale Station Two Trk. Width MARKET/BEALE STATION TOTAL SEGMENT	213+28 216+20 227+00 3,030'	216+20 227+00 3,030'												
#3BC	Beale and Bryant, to Market/ Beale Station.	200+81	227+00												
	STA 206+50 BK = 197+54 AHD														
	CUT & COVER Bryant to Bryant on Beale.	200+81	205+00				419'								
	CUT & COVER from Beale & Bryant to Bay Bridge.	205+00	205+80				80'								
	CUT & COVER Bay Bridge and Beale	205+80	206+50												
	CUT & COVER Bay Bridge and Beale	197+54	198+09	70'											
	CUT & COVER From Bay Bridge to STA 203 +50 Rock Bolt	198+09	203+50	55'											
	CUT & COVER From Sta 203+50 to Sta 205+00 Three Track Width	203+50	205+00												
	CUT & COVER From STA 205+00 to Market Beale staggered station	205+00	210+20			520'									
	Three Trk Extra Wide MARKET/BEALE STATION Shared Construction	210+20 210+20	227+00 216+50	1,680'			630'								

**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE**

9-22-95
By BCC/RLM

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**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE**

9-22-95
By BCC/RLM

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF)										SHORING WALL HEIGHT (ft)		
				STA - TION	BAY BRG. ANCHOR - AGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	Estimate	Site Specific
#3CM	Three Trk Width CUT & COVER From Bay Bridge to Mission/Folsom Station. Four Trk. Width MISSION/FOLSOM STATION	205+00	210+10						510'							
	TOTAL SEGMENT	210+10	220+90 2,905'	1,080'	125'				510'	1,190'						
	1-80, to Mission/Beale Station.	196+70	220+90													
	MINED TUNNEL to Beale & Harrison	196+70	203+50										680'			
	CUT & COVER Beale & Harrison to between Folsom & Harrison. Three Trk Width CUT & COVER Beale & Folsom to Mission/Folsom Sta Four Trk Width MISSION/FOLSOM STATION	203+50 205+00 210+10	205+00 210+10 220+90 2,420'						150'							
#4	Third and Townsend to Delancey & Embarcadero	169+50	187+80													
	CUT & COVER from Third to STA 182+00	169+50	182+00							1,250'						
	CUT & COVER from STA 182+00 to 186+80	182+00	186+80						480'							
	CUT & COVER (Tentative selection)	186+80	187+80						100'							
	TOTAL SEGMENT		1,830'						580'	1,250'						
#5	Delancey & Embarcadero to approx. Bryant on Beale.	187+80	200+81													
	CUT & COVER (Tentative	187+80	197+80						1,000'							



CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE

9-22-95
By BCC/RLM

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF)										SHORING WALL HEIGHT (ft)		
				STA- TION	BAY BRG. ANCHOR- AGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	Estimate	Site Specific
	MINED TUNNEL past Brannan to STA 193+85	190+50	193+85													
	TOTAL SEGMENT		1,885'													
#8	Brannan on Colin P. Kelly to Folsom on Essex St.	193+85	204+50													
	MINED TUNNEL Brannan to portal at Folsom	193+85	204+50													
	TOTAL SEGMENT		1,065'													
#9A	Folsom to TTT	204+50	228+55													
	CUT & COVER @ portal	204+50	207+00													
	RETAINED CUT	207+00	210+00			300'										
	AERIAL to TTT	210+00	216+70		670'											
	TRANSBAY TERMINAL (TTT)	216+70	228+55	1,185'												
	TOTAL SEGMENT		2,405'	1,185'		670'		300'		250'						
#9B	Folsom to TTT	204+50	228+55													
	MINED TUNNEL TO PORTAL	204+50	208+00													
	CUT & COVER @ portal to TTT	208+00	216+70							870'					350'	
	TRANSBAY TERMINAL (TTT)	216+70	228+55	1,185'												
	TOTAL SEGMENT		2,405'	1,185'						870'					350'	
	Third and Townsend to Colin P. Kelly and Brannan via short rad. turn	169+50	193+85													
#10	STA 178+10 BK = 178+65 AHD															
	CUT & COVER from Third & Townsend to STA 178+10	169+50	178+10													
	CUT & COVER from STA 178+10 to SPECIAL CUT - AND-COVER UNDER HISTORIC BUILDINGS	178+65	180+00							860'					135'	



**CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE**

9-22-95
By BCC/RLM

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF)								SHORING WALL HEIGHT (ft)				
				STA-TION	BAY BRG. ANCHOR- AGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	Estimate	Site Specific
#11	SPECIAL CUT -AND-COVER UNDER HISTORIC BUILDINGS	180+00	185+00								500'					
	CUT & COVER Portal to Portal	185+00	190+50								550'				335'	
	MINED TUNNEL past Brannan to STA 193+85	190+50	193+85													
	TOTAL SEGMENT		2,380'								2,045'				335'	
	Third and Townsend to Colin P. Kelly and Brannan via long rad. turn	169+50	193+85													
#12	STA 169+50 BK = 172+42 AHD															
	STA 193+90 BK = 193+85 AHD															
	MINED TUNNEL from Third & Townsend to Brannan on Colin P. Kelly	172+42	193+90												2,148'	
	TOTAL SEGMENT		2,148'												2,148'	
	Second and King, to Delancey and Embarcadero	175+00	184+88													
#12	STA 184+88 BK = 190+00 AHD															
	CUT & COVER from King & Second to 100' from King and Embarcadero	175+00	179+00							400'						
	CUT & COVER (Tentative Sselection) along Embarcadero to Townsend & Embarcadero	179+00	184+88							588'						
	TOTAL SEGMENT		988							988'						

10 Twin Glens Road, Ithaca, New York 14850
607-272-4029

EXPRESS MAIL

27 September 1995

David Minister
ICF Kaiser Engineers, Inc.
1800 Harrison Street
Oakland, CA 94612

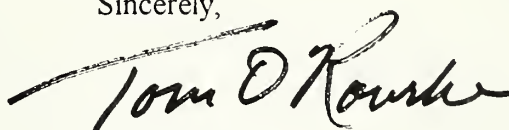
RE: Board of Consultants Report Following the Meeting of September 14, 1995

Dear David,

Enclosed please find a final version of the referenced report. By copy of this letter, the report is being sent to Demetrious Koutsoftas, Tor Brekke, and Norm Nadel.

The Board is pleased to be involved in the engineering and planning of this project.

Sincerely,

A handwritten signature in black ink that reads "Tom O'Rourke". The signature is written in a cursive, flowing style with a long horizontal stroke at the beginning.

T.D. O'Rourke

enc.

cc: T. Brekke
D. Koutsoftas
N. Nadel

September 27, 1995

**CALTRAIN COMMUTER RAIL DOWNTOWN
SAN FRANCISCO EXTENSION**

**REPORT FOLLOWING THE
BOARD OF CONSULTANTS MEETING
SEPTEMBER 14, 1995**

Prepared by the Board of Consultants

This report has been prepared to summarize the major issues discussed and principal recommendations made by the Board of Consultants (BOC) during its meeting of September 14, 1995 at the offices of De Leuw Cather in San Francisco, CA. A list of those attending the meeting is available in Appendix A. A list of the BOC members is provided in Appendix B.

The Board was asked to comment on the technical feasibility, appropriate construction methods, potential difficulties, and relative costs associated with underground construction for Alternatives 2 and 3 for the CalTrain Commuter Rail Downtown San Francisco Extension. The Board's recommendations pertaining to Alternatives 2 and 3, as well as rock tunneling and soft ground tunneling, are summarized under the headings that follow.

ALTERNATIVE 2

Alternative 2 covers six potential route configurations, all of which include a terminal station on Beale St. The terminal station will involve one of three options: 1) stacked twin track platforms in an 83-ft-deep excavation between Market and Mission Sts. (2A-C), 2) staggered twin track platforms in a 55-ft-deep cut on Beale St. and the Caltrains right-of-way (R/W) east of Beale between Mission and Folsom Sts. (2B-C), and 3) four track center platform station in a 55-ft-deep cut at the same location as the preceding option (2C-C). These three options, designated as 2A-C, 2B-C, and 2C-C, involve cut-and-cover construction along Beale to the Embarcadero, some form of soft ground or cut-and-cover tunneling along the Embarcadero to Townsend St., and cut-and-cover construction along Townsend to the area near Fourth St. Three additional options under Alternative 2 involve rock tunneling (2A-M, 2B-M, and 2C-M) from a location near the intersection of Beale and Folsom Sts. on a broad curve to the intersection of Third and Townsend Sts.

The cut-and-cover construction for the various options of Alternative 2 is technically feasible, and the support systems proposed by Dames & Moore for various sections of the routes are appropriate for stability and ground movement control.

With the exception of the deepest cuts on Beale St. for the 3-level stacked station between approximately Market and Mission, it has been proposed that the originally specified soldier pile tremie concrete (SPTC) walls be replaced by soil mixed walls (SMWs) with heavy steel sections (W 30 x 220) on 4-ft centers. The Board concurs with this recommendation, which will reduce the risk of slurry trench instability near the tip elevations of adjacent pile foundations, and notes that the use of SMWs will involve less expense than the SPTC walls. The Board also notes that, for cost estimating purposes, the SPTC walls have been assumed to provide only temporary excavation support. In contrast to SMWs, which are suitable only for temporary support, SPTC walls can be used in the permanent structural support system. At a future stage in the design, it may be advantageous to evaluate SPTC walls as providing both temporary and permanent support for the underground railway structures.

The 55-ft-deep excavation on Beale St. and the Caltrains R/W between Mission and Folsom Sts. will be 150 ft wide, with its east wall adjacent to the pile foundations of the Pacific Gateway Building. Because of pile group bearing pressure at about the level of the Old Bay Mud, combined with the depth of the adjacent excavation, the potential exists for significant settlement of the pile group. The Board, therefore, concurs with the proposed two stage excavation adjacent to the Pacific Gateway Building. This approach provides a prudent basis for estimating the cost of construction in which the excavation procedure is designed to protect the adjacent building. The Board notes that further site characterization may disclose clay strength characteristics and pile group bearing pressures more favorable than currently assumed such that a staged excavation approach may not be needed. Accordingly, the Board recommends that an upper and lower bound estimate of cost be made for the construction in this area pertaining to a double and single stage excavation, respectively. In this way, the costs can be bounded within a realistic range of potential contingencies.

The cut-and-cover construction between Colin P. Kelly, Jr. and Delancey Sts. and between Third and Fourth Sts. is shown in the draft geotechnical report with SMW toe penetration either in rock or 30 ft below the base of excavation. If dewatering outside the excavation is assumed as suggested in the report, a deep toe embedment would not be required for seepage control. It is likely under these conditions that a toe embedment of 15 to 20 ft will be suitable for vertical wall stability and ground movement control.

The 83-ft-deep excavation on Beale St. associated with option 2A-C is currently proposed to be 75 ft wide, and there is little separation between the SPTC walls and adjacent buildings. It would be advantageous to provide at least a 3 ft separation between the exterior wall and building line to reduce the potential for building damage during SPTC construction. This adjustment will require a terminal station excavation width of about 70 ft.

Option 2A-C will require a 75-ft wide excavation near the Harrison St. Bridge and the west anchorage of the San Francisco-Oakland Bay Bridge. The proximity of excavation to the

foundations of the Harrison St. Bridge and the Bay Bridge anchorage will require special excavation and support procedures, as proposed by Dames & Moore. The Board concurs with these procedures, which near the Bay Bridge anchorage involve staged excavation and incremental support in approximately 25-ft-long sections adjacent to the anchorage. The Alternate B staged excavation procedure, explained at the BOC meeting, should be used for cost estimating purposes.

During the BOC meeting, it was disclosed that the basements of some high-rise buildings on Beale St. encroach on the R/W of the 83-ft-deep excavation. Such encroachment will involve additional difficulties and costs associated with access, alteration, and potential underpinning and removal of basements. The Board believes that option 2A-C is the least attractive of the cut-and-cover operations because of these encroachments, and because of the considerable depth of station excavation and wide excavations near the Harrison St. Bridge and Bay Bridge anchorage. Option 2B-C would encounter similar difficulties even though it is shallower.

In contrast, Option 2C-C allows for excavation of considerably less depth. The Board recommends that the width of excavation be reduced to 42 ft in the vicinity of the Harrison St. Bridge and Bay Bridge anchorage. In addition, the Board recommends both that the excavation base be raised as much as 15 ft and that the excavation be shifted as far east as possible away from the Bay Bridge anchorage. These adjustments in depth and plan should place the anchorage outside the zone of influence for significant excavation effects on the structural and functional integrity of the anchorage. With appropriate changes in width, depth, and plan location near the Bay Bridge anchorage and Harrison St. Bridge, Option 2C-C is the most advantageous of the cut-and-cover options.

Consistent with the Board's recommendations following the July 6, 1995 BOC meeting, the rock tunneling options 2A-M, 2B-M, and 2C-M are all subject to very difficult tunneling conditions along the broad curve from the intersections of Folsom and Beale Sts. to Third and Townsend Sts. These tunneling conditions are associated with significant risk of undermining overlying structures and of incurring substantial expense, as explained under the section of this report entitled "Rock Tunneling".

Several soft ground tunneling approaches have been considered along the Embarcadero roadway. Various tunneling options for this portion of Alternative 2 are discussed in the section of this report entitled "Soft Ground Tunneling".

ALTERNATIVE 3

Alternative 3 covers four potential route configurations from Townsend St., all of which include a terminal station on the site of the existing Transbay Transit Terminal. Two of the four route and terminal options involve above and below ground train access at the Transbay Terminal (3A-C and 3B-C, respectively), cut-and-cover construction along most of the route, and an

approximate 1400-ft-long section of rock tunnel from a point near the intersection of Folsom and Essex Sts. to a location between Brannan and Bryant Sts. near Colin P. Kelly, Jr. St. The two additional options under Alternative 3 (3A-M, and 3B-M, respectively) involve rock tunneling from the intersection of Folsom and Essex Sts. to the intersection of Third and Townsend Sts., in combination with above and below ground train access at the Transbay Terminal.

The cut-and-cover construction for the various options of Alternative 3 is technically feasible and the support systems proposed by Dames & Moore for various sections of the routes are appropriate for stability and ground movement control. As a clarification, the Board notes that the excavation width along Colin P. Kelly, Jr. St. is planned as 42 ft. This width should be checked to confirm that it provides sufficient separation between the excavation wall and buildings for work to proceed without damaging the building facades.

Consistent with the BOC recommendations following the July 6, 1995 meeting, the 2500-ft-long rock tunneling along the curved portion of the route which connects the intersections of Folsom and Essex Sts. to Third and Townsend Sts., associated with options 3A-M and 3B-M, carries significant risk of undermining overlying structures and incurring substantial expense. In contrast, limiting the length of rock tunneling to only 1400 ft from the intersection of Folsom and Essex Sts. to a location between Brannan and Bryant Sts. (Options 3A-C and 3B-C) confines the difficult conditions to a relatively short section of the route where tunneling will be performed beneath only two or three buildings plus the I-80 freeway. Selecting Option 3B-C would increase the tunnel invert depth, thereby increasing the rock cover above the tunnel crown under Rincon Hill to larger and more desirable levels. Further discussion of rock tunneling is provided in the next section.

The 3A-C and 3B-C railway routes would follow a curve with an approximate 400-ft radius from Townsend to Colin P. Kelly, Jr. St., where it would pass beneath two 100-year old, historic brick masonry buildings. It is not advisable to drive a tunnel under mixed face conditions beneath these buildings. A more advantageous approach would involve underpinning the structures in conjunction with cut-and-cover construction. Reinforcing the building foundations and underpinning with needle beams and/or special frames are technically feasible and less costly and risky than mixed face tunneling.

ROCK TUNNELING

Although "rock tunneling" is discussed in this report, the Board uses this term cautiously. The term should not create a false impression regarding the nature of the tunneling operation, which will involve construction in both "rock-like" and "soil-like" materials.

The geology along the tunnels varies considerably, and includes sands, clays, weathered and fractured sandstones (graywackes) and shales, and shear zones. Thus a mixed face condition

is at hand because geological materials of quite different properties will be present in the tunnel face at one time. Further, the materials are by-and-large of such poor quality for tunneling that partial face excavation (i.e., only part of the tunnel cross-section) must be performed to minimize the excavated face area to be able to prevent the loss of ground. Such loss could readily propagate to the surface, causing severe impacts on structures, streets, and utilities.

Under these conditions, the Board believes that mining a single double track tunnel would be preferable to excavating two single track tunnels. The difficulty of maintaining the relatively narrow unexcavated pillar between twin tunnels, and the efficiency that results from the reduction of the number of excavation and support passes in the case of the single tunnel are important factors in favor of the single double track tunnel. It is recommended, therefore, that the engineering plans focus on a single, double track tunnel rather than twin tunnels.

During the July 6, 1995 meeting, a tunneling procedure for a single double track tunnel was discussed in which a center drift and two wall plate drifts could be excavated in the tunnel heading, followed by sequential excavation and support of the left and right sides of the heading. The initial drifts at the top of the tunnel can be used for exploration purposes, as well as for access points for grouting and dewatering. The remainder of the tunnel face could be excavated by removing the bench while providing support for the sidewalls. This sequence of work was intended to illustrate the phased excavation and incremental support process, and as an aid to estimating potential costs. Alternative excavating procedures may be equally valid.

Particular attention is required to the means by which the lower side walls can be supported in earth or in very poor rock. Rock bolts can be an effective tool to support tunnel openings. The mixed and fractured nature of the ground, however, may make them unreliable for the proposed work. To the extent rock bolts can be employed, particularly for the temporary support of tunnel sidewalls, Swellex bolts are recommended. They can be installed quickly and reliably.

It is probable that portions of the partial face excavation can be carried out using a mechanical excavator, such as a roadheader. It would be ideal if all of the rock excavation could be performed in this manner. However, the strength of some of the sandstones, and the limited fracturing at some locations may limit excavation in this fashion. Blasting may be the only effective way to perform some of the excavation when zones of competent sandstone are encountered.

Because of the presence of sands and soft clays in the face at some locations, control of groundwater is essential to keep these materials from flowing into the tunnel excavation. Wells can be installed to a depth below the tunnel invert and pumping started two to three months in advance of the tunnel excavation. However, where the sands overlay relatively impervious materials, such as clay or rock, it is impossible to dewater totally the sands. The best that could

be accomplished in these circumstances is the reduction of the water pressure in the sands. Mining in the vicinity of these sands will be very slow, and will require great care on the part of the miners to prevent loss of ground. It is difficult these days to assemble a crew of people with the requisite skills and experience.

Installation of dewatering wells along the route may prove to be infeasible unless owners of private properties grant access for installation and operation of the wells. Dewatering from the tunnels may be feasible, but extraordinarily costly because of the interference it causes to the tunnel excavation. Such dewatering is also limited by the inability to dewater the sands over impervious materials. Dewatering, whether conducted from within the tunnel or from above, may depress ground water tables locally and cause consolidation of soils such as the Recent Bay Mud. Settlements of structures, street surfaces, and utilities can result unless special measures, such as underpinning or compaction grouting, are employed.

As an alternative to dewatering, ground freezing, grouting, and compressed air can be employed. Ground freezing and grouting are very expensive and slow, particularly if they must be performed from within the tunnel. Provision for the use of compressed air should be made at the outset, even if its use may not be ultimately required. In this way, if needed, it can be mobilized quickly, and the tunnel work can be advanced expeditiously. The problems associated with the expulsion of gasses and vapors, which is discussed with respect to the soft ground tunnels at the Embarcadero, are less likely to be as severe in the vicinity of the rock tunnels being considered. Nonetheless, variations of ground water elevation and permeability of soils along the alignment could lead to air losses that may force toxic gasses or fumes from contaminated soils and rock into adjacent buildings.

It follows from the foregoing discussion that it is advantageous to have as much rock cover as possible above the crown of the tunnel. Except for the tunnel from the intersection of Folsom and Essex Sts. to a location between Bryant and Brannan Sts. (Options 3A-C and 3B-C), insufficient rock cover will be a problem for significant portions of the proposed rock tunnel sections. Tunneling for Options 3A-C and 3B-C will still be difficult, but the rock tunneling in these cases will be confined to relatively short length, which has substantial rock cover and is located below only three buildings. As explained previously, Option 3B-C would increase the rock cover relative to Option 3A-C, thereby providing for more advantageous tunneling conditions.

Estimating tunneling costs is a highly subjective enterprise. It is far from an exact science. Frequently, when experienced contractors submit bids for tunnel work which has been designed in great detail, the variation in the bids is substantial. The differences are the results of the bidders' different perceptions of the difficulties which will be encountered. Accordingly, at this stage of planning, it is very difficult to provide reliable estimates of tunnel costs. In contrast, cost estimates for cut-and-cover will be significantly more reliable and less sensitive to uncertainties associated with ground conditions and effects on adjacent property.

During the September 14, 1995 BOC meeting, the construction of a 75-ft-wide, four-track tunnel for the 2A-M option was discussed. This section of rock tunneling would be approximately 600 ft long from the intersection of Harrison and Beale Sts. southwest to the I-80 freeway. The staged excavation and incremental support procedures proposed for this section of tunnel represent an appropriate means of estimating the construction costs. Because of the poor quality of the rock, this section of the tunnel will be very difficult to excavate and stabilize. The problems associated with rock support and ground movement control, in combination with the substantial expense of the staged excavation and incremental support procedures, are significant disadvantages for this option.

SOFT GROUND TUNNELING

Twin soft ground tunnels are being considered for about 1000 ft of the route under the Embarcadero as part of options 2A-C, 2B-C, and 2C-C. The surface area where the tunnels are to be driven was created by filling in the bay. During its history, there were wharves and docks in the area where ships may have been sunk and abandoned in place. Certain to be encountered will be timber piles which were used to support the waterfront structures. The nature of the soil and its location below the ground water table make it essential to stabilize the face of the tunnels while they are being excavated.

During the September 14, 1995 BOC meeting, the possibility of using an earth balance shield was discussed. If an earth balance shield were to encounter buried piles and ships, substantial problems would result with respect to stabilizing the tunnel face and disrupting the tunneling operation. Although the Board believes it is unlikely that an earth balance shield will be effective here, it nevertheless would be helpful to obtain historic information about previous structures in the area. The historic information may show locations with a high likelihood of piles and buried debris from which a more detailed assessment of earth balance shield feasibility could be made.

Another option may involve the strengthening of the ground by jet grouting from the surface. Apart from its apparently great expense, this has the disadvantage of causing considerable disruption to activities at street level along the Embarcadero. It is advisable to obtain additional information about jet grouting operations and their environmental consequences from a knowledgeable contractor who has substantial experience with the method. Furthermore, it will be advantageous to obtain information on the costs of jet grouting directly from the San Francisco Department of Public Works in relation to its recent application during construction of the Islais Creek Transport/Storage Facilities.

The use of compressed air in the tunnels is another possibility, but its use can cause the expulsion from the ground into the surrounding buildings and nearby vicinity of unpleasant and possibly noxious gasses and vapors. Many such problems occurred during recent compressed air

tunneling in San Francisco. Compressed air is also very expensive and can involve some physical risk to the workers and to people in the neighboring structures.

As discussed at the September 14, 1995 BOC meeting, the most advantageous option in this area may be what was called "environmentally sensitive" cut-and-cover (ESCC) construction. The ESCC approach would involve the use of concrete beams or panels as covers that are placed flush with current street and sidewalk grades. These features have been incorporated on a short section of the Muni Metro Turnaround, and also on recent sections of the L.A. Metro. Open cuts or shafts for transportation of muck, tunnelers, and materials would be located away from this sensitive area. Moreover, certain construction operations could be limited to specific times of the day, and noise controls implemented through the use of special equipment. If the ESCC approach is adopted, the Alternative 2 route would end near the intersection of Beale and Mission Sts. with cut-and-cover construction along the Embarcadero.

CONCLUDING REMARKS

On the basis of the findings and considerations discussed above, it is the opinion of the Board that certain options are most advantageous with respect to other options regarding the application of underground technology and protection of adjacent structures. For Alternative 2, Option 2C-C is most advantageous, especially if the excavation is shifted as far east as possible away from the Bay Bridge anchorage and its base is raised by approximately 15 ft in this vicinity. For Alternative 3, Option 3B-C is the most advantageous for route construction to a new Transbay Transit Terminal.

APPENDIX A

Appendix A
Attendance at Board of Consultants Meeting

**CALTRAIN SPECIAL
BOARD OF CONSULTANTS MEETING**

14 September 1995

Name	Affiliation	Phone
Tom O'Rourke	Board of Consultants	607-255-6470
Daniel Meyersohn	Dames & Moore	415-243-3738
Andy Nash	CalTrain/JPB	415-508-6327
David Minister	ICF KE	510-419-6762
Ben Cavin	ICF KE	510-419-5035
Lou Salaber	ICF KE	510-419-6139
Demetrious Koutsoftas	Dames & Moore	415-243-3840
Norman A. Nadel	Board of Consultants	914-279-5516
Tor L. Brekke	Board of Consultants	510-527-3499
John Selin	De Leuw Cather	415-495-6060
Dave Mansen	De Leuw Cather	415-495-6060

APPENDIX B

Appendix B
Board of Consultants

SPECIAL BOARD OF CONSULTANTS

**CALTRAIN COMMUTER RAIL DOWNTOWN
SAN FRANCISCO EXTENSION**

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CALTRAIN S.F. DOWNTOWN EXTENSION

CAPITAL COST ESTIMATE METHODOLOGY DESCRIPTION

To estimate the capital costs for required utility relocation/reinforcement, the following methods were used.

1. Identify the types and sizes of existing underground utilities within the project area. Calculate the length or number of existing utility facilities, classified as parallel to or crossing the proposed alignment, and tabulate each by alignment segment.
2. Classify affected utilities as to disposition; relocate, leave-in-place, support-in-place, etc.
3. Assign unit cost values based on input from utility companies, responsible agencies or departments, and historic cost data records.
4. Tabulate estimated costs within each alignment segment organized by utility system.
5. Compute the total estimated utility cost for each alignment segment.



INTER OFFICE MEMORANDUM

RECEIVED
SEP 21 1995
FEDERAL BUREAU OF INVESTIGATION

TO Lou Salaber
AT Oakland

DATE September 21, 1995

FROM Paul Miclea

COPIES TO D. Minister
M. Deng

AT Oakland

JOB NO. 65928-004-05

SUBJECT CALTRAIN - TUNNEL AND STATION VENTILATION -
Operation Costs

Attached is a revised estimate of operating costs elements for the station and tunnel ventilation, as well as some details for the required smoke extraction duct along the station. Please let me know if you have any comments on this document.

Thanks,

A handwritten signature in cursive script, appearing to read "Paul", written over the word "Thanks,".

Attachments

CalTrain Downtown San Francisco Extension Ventilation System Cost Estimate

Train Operation Schedule

The ventilation system is required to satisfy the following train operation schedule:

Morning peak-hour (7:00 to 8:00 a.m.)

- 9 trains arriving (equal 6.67-minute headway), using all 4 tracks
- 4 trains departing (equal 15-minute headway), from all 4 tracks

Evening peak-hour (4:50 to 5:50 p.m.)

- 9 trains leaving (6.67-minute headway)
- 4 trains arriving (15-minute headway)

Off-peak hours

- One train per hour (arriving at half-hour, departing on the hour), on either track
- Half-hour dwell time

Train consist and operation

- 10-car trains, powered by two locomotives, one at each train-end during peak-hours
- Shorter (minimum 4 cars) during off-peak hours, on either track
- Up to 160 passengers per car, maximum 1600 per train

Ventilation system operation during normal train operation

Two separate ventilation systems are proposed: one for the station, and the other one for the tunnels (from portal to the station). Both systems consist of shafts, fans, ducts, dampers and controls. Passive vents, equipped with dampers, are to be provided along the tunnels.

During normal train operation, the station will be ventilated by fans which will extract the locomotive exhausts and will bring fresh air down entrances. The number of fans and their capacities depend on the number of trains dwelling at platforms, and on the locomotive type. Fan operation will be controlled by sensors installed along the platforms. It is expected that the discharge from station fans would have to be at a certain height above the street level. *Assume so'*

The tunnels will be ventilated mainly by the piston effect of the moving trains. Operation of tunnel fans during train movement is not efficient. Passive vents along the tunnel will bring fresh air to dilute the emissions and diminish the pressure built ahead of the moving train. The number of vents and their size depend on the locomotive type and emissions. There will be more vents for diesel locomotives(64 to 88, depending on alignment alternative), fewer for LNG locomotives(14 to 16) and for electric locomotives (12 to 14).

The tunnel fans will be activated in case a train will be stalled or stopped for whatever reasons in the tunnel. When fans are activated, nearby vent dampers will be closed.

General cost considerations

Both fixed costs and annual operation costs need to be taken into account. The fixed costs include the equipment, installations, and construction of the structures required to house the equipment. The annual operation costs consist of power cost for operation and maintenance cost. When annualized capital cost is used for comparing different system alternatives, the equipment costs are usually capitalized over an assumed equipment life of 30 years for rapid transit tunnel fans, and the structure costs are usually capitalized over an arbitrary structure life of 50 years.

The following list contains the elements that will contribute to the CalTrain Downtown San Francisco Extension Ventilation System Cost Estimate (Alternatives 2A-T and 2B-T).

Assume that ventilation exhausts are allowed to discharge to grade level.

A. Using diesel-powered 12-645E3B engine

Total ventilation airflow requirements are 320 kcfm for station and 0.457 kcfm per foot in the tunnel. Station will be ventilated by fans all the time during the operation hours. Tunnel will be ventilated by the airflow generated by the piston effect of the trains.

Fixed Costs:

1. Fan Plant at north end of the station

- 2 @ 200 kcfm, reversible, two-speed, axial fans.
- Dampers
- Controllers for fans and dampers
- Attenuators (silencers)
- Fan room and control room structures
- Ducts and gratings (at street level).

2. Station ducts for smoke

- Ducts on each platform level (one central or two ducts above the tracks)
- Hoods and louvers to capture smokes at six locomotive stopping locations (3 above each track)
- Dampers and controllers
- Thermo-sensors to activate damper controllers at six locations

3. Emission sensors in the station

- Smoke monitors (obscurity meter)
- CO monitors
- CO₂ monitors
- NO₂ sensors

4. Fan Plant in the tunnel

- 2 @ 250 kcfm, reversible, two-speed, axial fans
- Dampers
- Controllers for fans and dampers
- Attenuators
- Fan room and control room structures
- Ducts and gratings (at street level).

5. Passive vent shafts along the tunnel

- Two vent shafts on each site, connected to either trackway, the sites are spaced every 180 feet along the alignment. Each shaft is assumed of 200 Sq feet cross-section
- Dampers and controllers for the shafts.

Operation Costs:

1. Station ventilation operation

- Normal operation mode of the end station fans will be with the fans in exhaust at a maximum capacity of 400 kcfm, and at 400 hp
- The station fans should be able to operate at 100 kcfm, 200 kcfm and 400 kcfm automatically, based on the emission concentration level sensed by the emission monitors
- Maintenance of equipment and structures.

Assumptions:

- fans will operate continuously for 2 peak-hours
- during off-peak hours one fan will operate at 100,000 cfm, 100 hp for maximum 10 hrs per day

Cost: $(400 \text{ hp} \times 2 \text{ hrs/day} + 100 \text{ hp} \times 10 \text{ hrs/day}) \times 300 \text{ days/yr} = \underline{540,000 \text{ kWh/yr}}$

2. Tunnel ventilation operation

- Fans in the tunnel will only be operated during the emergency or congested conditions (that are considered as not very often)
- Maintenance of equipment and structures.

Assumptions:

- fans will be tested monthly for 30 minutes
- one train will stop in the tunnel for 15 minutes, causing the fans to operate for half hour at full 500,000 cfm capacity

Cost: $500 \text{ hp} \times 1/2 \text{ hr/day} \times 300 \text{ days/yr} + 500 \text{ hp} \times 1/2 \text{ hr/mo} \times 12 \text{ mos/yr} = \underline{78,000 \text{ kWh/yr}}$

B. Using 100% LNG-powered engine

Total ventilation airflow requirements are 100 kcfm for station and 0.120 kcfm per foot in the tunnel. Station is proposed to be ventilated by fans during the train operation hours. Tunnel will be ventilated by the airflow generated by the piston effect of the trains.

Fixed Cost:

1. Fan Plant at north end of the station

- 2 @ 200 kcfm, reversible, two-speed, axial fans.
- Dampers
- Controllers for fans and dampers
- Sound attenuators (silencers)
- Fan room and control room structures
- Ducts and gratings (at street level)

2. Station ducts for smoke

- Ducts on each platform level (one central or two ducts above the tracks)
- Hoods and louvers to capture smokes at six locomotive stopping locations (3 above each track)
- Dampers and controllers
- Thermo-sensors to activate damper controllers at six locations

3. Emission sensors in the station

- Smoke monitors (obscurity meter)
- CO monitors
- CO₂ monitors
- NO₂ sensors

4. Fan Plant in the tunnel

- 2 @ 250 kcfm, reversible, two-speed, axial fans
- Dampers
- Controllers for fans and dampers
- Attenuators
- Fan room and control room structures
- Ducts and gratings (at street level)

5. Passive vent shafts along the tunnel

- Two vent shafts on each site, connected to either trackway, spaced every 800 feet along the alignment. Each shaft is assumed 200 Sq feet cross-sectional area
- Dampers and controllers for the shafts

Operation Costs:

1. Station ventilation operation

- Normal operation mode of the end station fans will be one fan in exhaust at 100 kcfm, at 100 hp
- The station fans should be able to operate at 100 kcfm, 200 kcfm and 400 kcfm automatically, based on the emission concentration level sensed by the emission monitors
- Maintenance of equipment and structures

Assumptions:

- one fan only will operate continuously for 2 peak-hours at 100 kcfm
- during off-peak hours one fan will operate at 100,000 cfm, 100 hp for maximum 6 hrs per day

Cost: $(100 \text{ hp} \times 2 \text{ hrs/day} + 100 \text{ hp} \times 6 \text{ hrs/day}) \times 300 \text{ days/yr} = \underline{240,000 \text{ kWh/yr}}$

2. Tunnel ventilation operation

- Fans in the tunnel will only be operated during the emergency or congested conditions, which are considered as not very often.
- Maintenance

Assumptions:

- emergency fans will be tested monthly for 30 minutes
- one train will stop in the tunnel for 15 minutes, causing one fan to operate for half-hour at 250,000 cfm

Cost: $250 \text{ hp} \times 1/2 \text{ hr/day} \times 300 \text{ days/yr} + 500 \text{ hp} \times 1/2 \text{ hr/mo} \times 12 \text{ mos/yr} = \underline{40,500 \text{ kWh/yr}}$

C. *Using Electric Locomotives*

Ventilation is required only for dissipating heat and maintaining air quality in the subway system. As suggest by *Subway Environment Design Handbook*, the ventilation system should be able to provide four air changes per hour. Thus, 0.09 kcfm per foot ventilation rate is required. Both station and tunnels will be basically ventilated by the airflow generated by the piston effect of the trains.

Fixed Cost:

1. Fan Plant at north end of the station

- 2 @ 200 kcfm, reversible, two-speed, axial fans.
- Dampers
- Controllers for fans and dampers

- Attenuators
- Fan room and control room structures
- Ducts and gratings

2. Fan Plant in the tunnel

- 2 @ 250 kcfm, reversible, two-speed, axial fans
- Dampers
- Controllers for fans and dampers
- Attenuators
- Fan room and control room structures
- Ducts and gratings

3. Passive vent shafts along the tunnel

- Two vent shafts on each site, connected to either trackway, spaced every 1000 feet along the alignment. Each shaft is assumed of 200 Sq feet cross-sectional area
- Dampers and controllers for the shafts

Operation Costs:

1. Station ventilation operation

- Fans in the station will only be operated during the emergency or congested conditions (periods that are considered as not very often)
- The station fans should be able to operate at 100 kcfm, 200 kcfm and 400 kcfm
- Maintenance of equipment and structures

Assumptions:

- the station will be ventilated by the train piston effect
- during peak hours one fan will operate at 100,000 cfm, 100 hp to extract the heat

Cost: $100 \text{ hp} \times 2 \text{ hrs/day} \times 300 \text{ days/yr} = \underline{60,000 \text{ kWh/yr}}$

2. Tunnel ventilation operation

- Fans in the tunnel will only be operated during the emergency or congested conditions (periods that are considered as not very often)
- Maintenance of equipment and structures

Assumptions:

- emergency fans will be tested monthly for 30 minutes
- one train will stop in the tunnel for 15 minutes, causing one fan to operate for half-hour to extract the heat at 250,000 cfm

Cost: $250 \text{ hp} \times 1/2 \text{ hr/day} \times 300 \text{ days/yr} + 500 \text{ hp} \times 1/2 \text{ hr/mo} \times 12 \text{ mos/yr} = 40,500 \text{ kWh/yr}$

Summary:

Diesel-powered locomotives	<u>618,000 kWh/yr</u>
LNG-powered locomotives	<u>280,500 kWh/yr</u>
Electrically-powered locomotives	<u>100,500 kWh/yr</u>

Ventilation Ductwork for CalTrain Station

1. The ductworks marked up on the drawings with pencils are not for scale, they only show the ideas.
2. The main duct sizes should be **no less than 25 ft²**.
3. The branch duct sizes should be **no less than 12 ft²**, and for rectangular ducts, aspect ratio **should not be bigger than 8**.
4. Ducts **inside the station** are preferred, in considering the difficulties of design and construction.
5. Inlets on the branch ducts should be about **12 ft²** each, with louvers installed.
6. Based on the conventional hood design method, and the above ductwork arrangement, the vertical distance between the branch duct inlet and the locomotive exhaust outlet **should not be bigger than 3.4 feet**.
7. No design guidelines are observed for smoke curtains, we suggest that **at least one foot** deep smoke curtain to be built at the locations where locomotives stop. Each curtained area is suggested to be **no less than 100 ft²**.

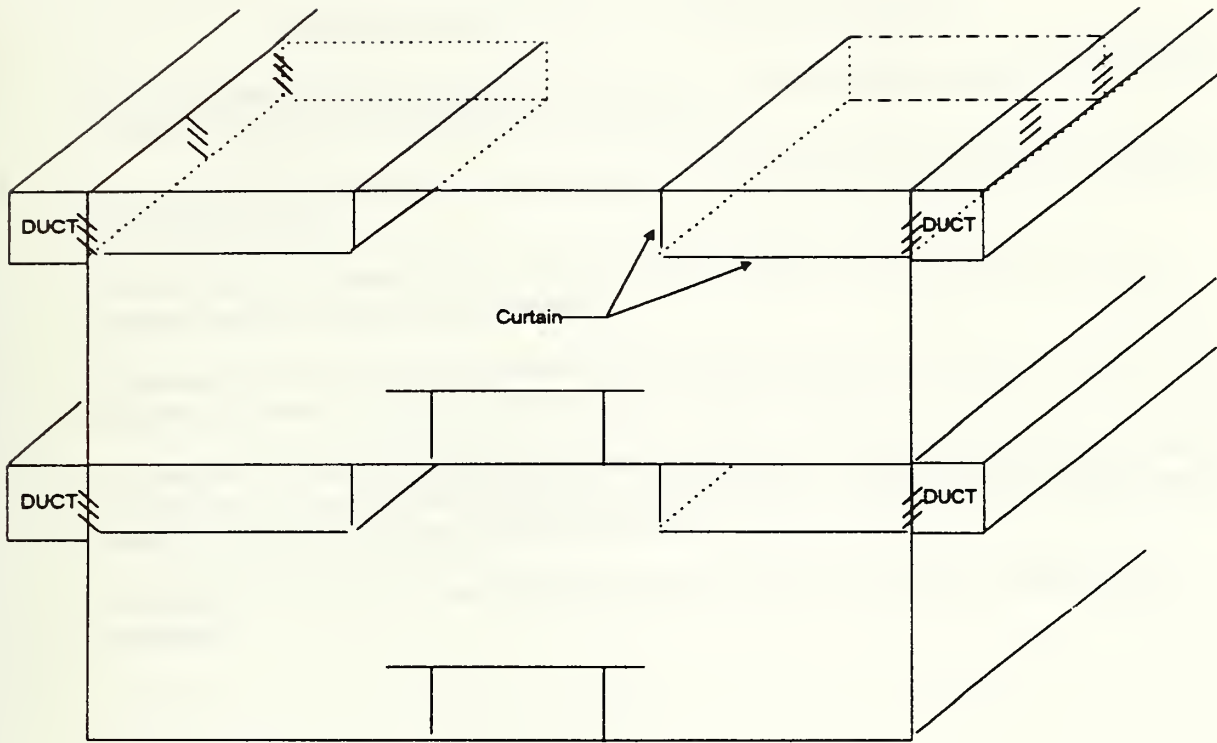


Figure 5-1 Sketch for the ducts and curtains layout in the Station

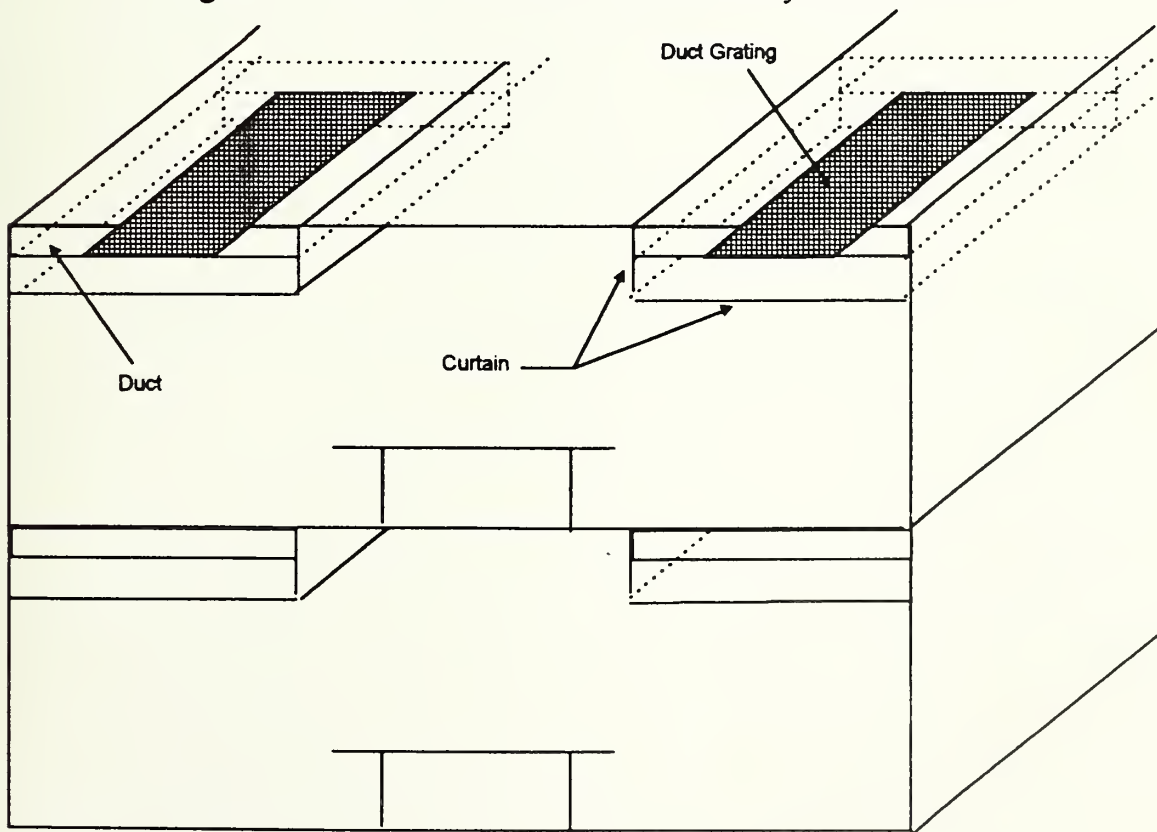


Figure 5-2 Sketch for the ducts and curtains layout in the Station

CALTRAIN PROJECT SIGNAL SYSTEM ASSUMPTIONS

1. The cost estimates of the signal system modification are not for the purpose of up-grading the signal system, but only making it compatible with electrification.
2. There is no special effort made to reduce the rail to ground resistance as would normally be done for a new electrified system.
3. It is assumed that the existing block lengths will remain acceptable for the braking characteristics, speed and operation of the electrified railroad.
4. It is assumed that there will be room available in the bungalows and cases for the new track circuit equipment necessary to adapt the existing system to 100 Hz. or cases.
5. It is assumed that work of modifying equipment, installing cable, installing signal bridges, or installing cases can be performed by outside contractor in a timely manner. Only final cutover testing would be reserved exclusively for railroad maintenance forces.
6. It is assumed that the rail is continuous except at special trackwork areas such as freight sidings or crossovers.

BASIS OF ESTIMATE

1. That to the greatest degree practicable, the existing cases, logic, bungalows, and wayside signals would be used or re-used.
2. That areas that have line wire would have the same functions transferred to underground line wire (typically new 27C #14), and that areas that have no line wire due to electrocode system would have the electrocode modified to 100 Hz. to transmit the same functions. Per discussion with JPB personnel, this is observed to be approximately 80 % of segment 3 and all of segment 5.
3. That the upgrade of track circuits between signal locations would be to 100 Hz. or PSO II type track circuits.
4. That highway grade crossing logic that uses audio frequency track circuits but no motion sensors or crossing predictors would not need to be disturbed. However, crossing cases that use predictors would need to be replaced with new cases (or racks for existing bungalow) with PSO track circuit and logic including battery and solid state gate crossing controller. In addition, there will be typically one additional new case per crossing to provide the PSO transmitter complete with power and battery. Per discussion with JPB personnel, it is noted that all grade crossing cases are either motion sensors or crossing predictor equipped.
5. San Francisco Terminal and San Francisco Yard will be controlled from San Jose control center. Code would be via separate fibers in fiber optic cable installed from San Jose to SF as part of communications upgrade to electrification.
6. That the traction power pole spacing from center of track can be adjusted to provide visibility for the existing signals up to 12 ft. 4 in. from center line of track. It is assumed that 25 % of the signal locations will need signal bridges for estimating purposes.
7. The rail will be made continuous for traction power negative return using dual 350-MCM web and impedance bonds and dual 250 MCM C bonds at standard joints for special trackwork.
8. The estimate for segment 3 is based on verbal descriptions of the trackwork and existing signal equipment with JPB technical personnel. The estimate for segment 5 is based on SP track signal charts plus verbal information.
9. The signal system modifications for segment 4 (Pullman Way Yard) is assumed to be zero cost because it has not been purchased yet it could be designed and installed compatible with electrification.

COMMENTS

Although the estimate is based on a rehabilitation of the existing signal system without upgrading the existing 40 year old equipment or upgrading the capabilities of the system to Central Traffic Control. The operation of a passenger railroad that has dual freight use needs control and indication in order to maintain schedules in emergency and maintenance situations. Therefore, if the signal system is to be modified for electrification, the JPB should consider additional upgrades beyond those identified in the estimate.

CALTRAINS COMMUNICATIONS

The following communications related system were considered/estimated for the proposed new CalTrains station in San Francisco:

- 1) Public Address (PA)
- 2) Closed Circuit Television (CCTV)
- 3) Fire and Emergency Management (F&EM)
- 4) Radio
- 5) Telephone
- 6) Variable Message Signs (VMS)
- 7) Supervisory, Control and Data Acquisition (SCADA)

The PA system is used for emergency evacuation announcements as well as a supplemental communications system for the emergency services, once the station has been evacuated. To qualify as such a system all of the elements of the PA system need to be supervised and an alarm given when a failure is detected. Such systems are listed by the Underwriters Labs and are further listed by the State of California Fire Marshall. As well as having provisions for routine announcements from a central location (Station Control Room), provisions for emergency announcements from microphones located at entrance(s) to the station were fire and emergency responses will use. Additionally pre-recorded emergency evacuation announcements will be needed. These are triggered by either station supervisory personnel or if a fire detector alarm remains unacknowledged for a predetermined time, the evacuation announcement is automatically initiated.

To enable PA announcements to be understandable, architectural control of reverberation time is required.

CCTV is primarily a security aid. Coverage of ticket vending and change making machines, station entrances, escalator wells and platforms are the usual areas covered. Views of ticket vending and change making machines are for revenue security. Views of escalator wells are to allow remote stopping of escalators for emergency evacuation. Views of station entrances are for general security and verification of emergency evacuation. Views of the station platforms allow crowd control and aid operations in verifying when trains have actually arrived and stopped or have started a departure. Fixed view cameras were assumed for this exercise, however, as the design becomes closer to being firmed up consideration of pan, tilt and zoom cameras

may be considered since there will probably be only one monitoring location.

The Fire and Emergency Management System will also be required to be Underwriters and California Fire Marshall listed. Various smoke, combustion products, temperature and rate of rise of temperature detectors will be required as well as monitoring sprinkler systems. A "Fire Alarm Control Panel" which centralizes all alarms from detectors and sprinkler systems will be required. Supplemental alarm panels may be required at entrances designated by the fire services.

In addition to fire detection, the F&EM system will contain intrusion detector capability to monitor doors to ancillary rooms, emergency exit doors and gates and some form of entry authorization (card key) for various non public areas in the station. The F&EM system contains the arrangement to incorporate "Blue Light" stations. These blue light stations allow emergency removal of power from the overhead power feed to the trainway. The fire services require these stations at each point where they may gain access to the trainway and they are also generally located at ends of platforms (just off of the platform) and at each end of special trackwork. The fire services may use rescue or special trains to take them to the location of a fire in the tunnel. Blue light stations are therefore required at each access point between tunnels.

The tunnel will require radio coverage for train operations channels and other railroad functions. It is assumed that there will be a RR police/security channel and a maintenance channel required. Additionally it is understood that within the near future all local public service radio will be converted to a trunked 800 MHz system. The BART communications people are planning on needing to furnish to 800 MHz channels for the fire and local police. The same coverage should be furnished in the CalTrains tunnel. Additionally, the emergency services will require 800 MHz coverage in all areas of the station. Because of the length of the tunnel, 800 MHz coverage is difficult, since the losses of the distributed coaxial cable antenna are considerable at these frequencies. Therefore a dual antenna system in each tunnel is recommended. One antenna is used for transmitting to the mobiles and portables in the tunnel(s) and the other antenna is used to receive signal from the mobiles and portables. With this arrangement, one way amplifiers can be used in each cable to make up for the losses at 800 MHz. The station proper will derive coverage by the use of a combination of leaky coaxial antennas running through various ancillary rooms and areas and space antennas to give coverage in the large volume areas such as the mezzanine and the platforms.

Three types of telephone service will need to be furnished by an electronic automatic (dial) telephone switchboard. Regular administrative dial telephone will be furnished in each of the areas where working personnel are normally stationed. Additionally, it is good practice to have a telephone just inside the door of all ancillary rooms. This phone can be used to initiate a fire alarm as well as for normal administrative and maintenance functions. Additional maintenance telephones are located next to equipment needing regular maintenance. Emergency telephones which connect directly to the control room without dialing when the handset is picked up are used at various strategic locations. Each of the blue light stations is equipped with an emergency telephone. Each emergency exit should have an emergency telephone just inside the door to the outside. Each elevator requires an emergency phone.

Additional direct connection phones are needed as passenger assistance phones. These are usually located near the fare vending machines and at the platform level.

Recent ADA legislation has required the use of Variable Message Signs to augment the PA system. These signs are required to closely repeat in text the spoken emergency messages on the PA system. The emergency evacuation messages need to be automatically initiated when the PA messages are automatically initiated. The VMS signs are usually also used for routine announcements, such as, train arrivals and departures. They can also be used to make general announcements, such as, time and date, pending fare or schedule changes, etc.

With modern control of station and tunnel ventilation by the use of PLC controllers there is no need for a SCADA system to initiate control of the various station functions from the control room. The various functions can be directly remoted to the control room via hard wired data links. There is a need to interface the blue light stations to the SCADA system that controls the traction power to the tunnels and platforms.



